PACKAGE engineering

7 Some unsolved problems of folding cartons

From the standpoint of a user plant packaging line operator, an expert takes a critical look at material, fabrication and operational aspects of cartons—and poses some solutions to these problems.

14 Fig bar packaging—with no time out for changes

Faced with a steady flow of product but an intermittent packaging operation (many stops for material changes) a production manager switches from unit to bulk packages—to keep up with the flow of fig bars.

18 New packaging operation for washers and dryers

How (1) tailor-made machinery, (2) an entirely new packaging line layout, (3) specially-developed procedures and (4) new case sealing equipment all fit together to provide a new appliance package.

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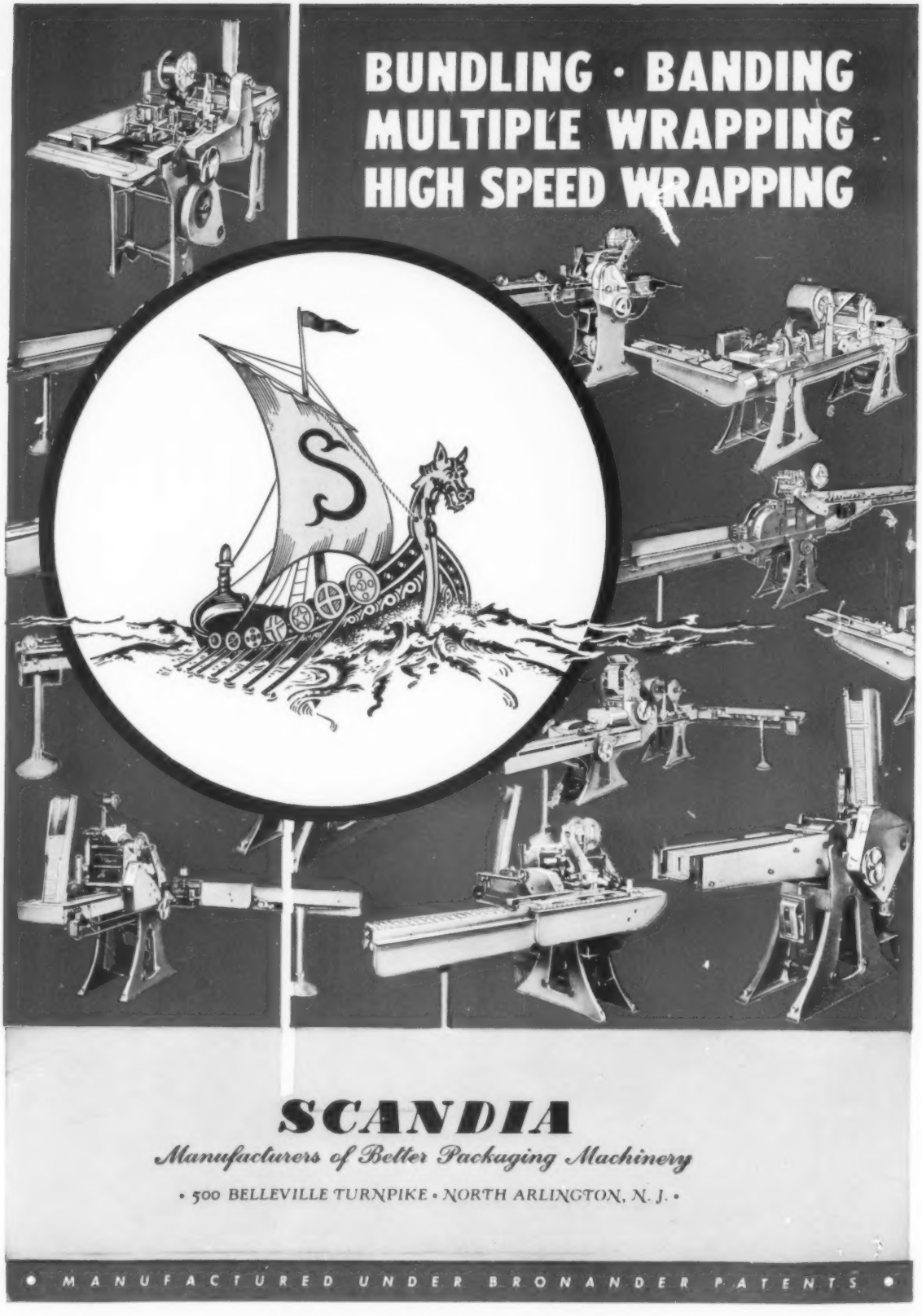
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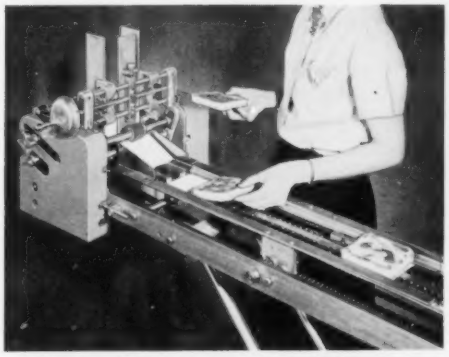

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PACKAGE engineering

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A look ahead

Factors governing the choice of an aerosol container for a particular purpose will receive thorough discussion in an article by Morris J. Root, technical director, G. Barr & Company, Chicago. Appearing in our March issue, this article not only will review materials, coatings, sizes and capacities, but also will evaluate container suitability for given uses—such as from the standpoint of factors such as corrosion, cost and shipping weight. No one concerned with aerosol containers can afford to miss Mr. Root's article.

Any packaging man who hears that an outside consultant is coming to his company will find both information and encouragment in an article by Halden L. Lewis, of Corning Glass Works, which will appear in our next issue. "You need not fear the coming of Mr. Packaging Consultant" is not only the title but also the theme of Mr. Lewis' discussion—which will point out that a typical packaging specialist has much to gain from working with a consultant.

The problem of providing a week's supply of 26 different cartons (tops and bottoms) faced W. L. Dunning, Chicago plant manager, of Lamson and Sessions Company. An analytical article by Mr. Dunning will tell not only how he capitalized on the well-known use of air to move formed cartons, but also how his organization integrated this system with its method of packaging nuts and bolts in accord with the recently established standards of that industry.

— R.B.H.

Contents

7 **Let's look at some unsolved folding carton problems,** by E. H. Balkema, general purchasing agent, Colgate-Palmolive Company
A critical review of some material and fabrication aspects of carton usage — together with a few suggested solutions.

11 **Know your packaging costs,** by John W. Kraus, section supervisor, quality control and packaging engineering, Accessories Division, Thompson Products, Inc.
Practical procedures (with forms and illustrations) as followed by this organization in its effort to determine specific package costs.

14 **Making packaging shifts fit flow of production,** by R. Bruce Holmgren, editor, Package Engineering
The Baking Division of Zion Industries packages a steady flow of fig bars — in spite of frequent stoppages for package changes.

17 **How Campana prevents discoloration of its white bottle caps**
A plant production manager found out a way of preventing black rubber (of machinery) from transferring to bottle caps.

18 **We put Hotpoint home laundry equipment into corrugated packaging,** by Edward Zelinski, packaging engineer, Hotpoint Company
A step-by-step examination of a new package, a new packaging line, and installation of a system for their use — combining both equipment and methods.

23 **Review of Packaging Institute's new glossary**

24 **Packaging a living organism,** by Dr. A. A. Hendrickson, chief bacteriologist, farm laboratory division, The Albert Dickinson Company
A case history of the evolution of a package for legume inoculators, revealing that material pinholing can prove advantageous.

27 **News of packaging personnel**

28 **Announcements of machinery and products**

32 **Industry literature available free**

28 **Reader service card**

36 **Editorial page**

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A note from the Publisher

Several months ago an item appeared in the New York Times announcing a new magazine on selling and salesmen. The article said, in part: " . . . on the theory that this country has won the battle of production and now must turn to distribution and specifically to selling . . . a new magazine will make its appearance."

I certainly agree that good salesmanship will be needed to sell the gross national product of $500 billion that is projected for 1965, but I don't agree with the inference that our production problems are all behind us.

It seems to me that too often the purely sales-minded individual forgets all about the relationship of selling, sales promotion and production. The high-cost producer must charge more than his direct competitor if he is to enjoy a comparable profit margin. The low-cost producer that has products competitive as to quality has little to worry about. He does not have as many sales problems as the intermediate or high-cost producer, and can do a better sales job.

A classic example of what a low-cost producer can do is the old Wieland Dairy in Chicago—now part of the Borden organization. It was the first dairy to bring milk from the farm to the dairy in tank trucks and, consequently, enjoyed a larger margin of profit than its competitors for several years. It invested these production savings in advertising, and soon had most of the milk business on the North Side of Chicago. This is an example of a company being able to increase business and lower cost even more because of an initial cost advantage.

In the early days of packaging, when the fact that a product was packaged at all assured it of some measure of success, there was little need for close attention to the selection of the proper package or material, or to utilize the most up-to-date machinery. Today, the alert packager is continually on the lookout for new or better packaging materials and opportunities to mechanize his packaging.

The failure to keep abreast will lead to excess packaging cost, and this can be the difference between profit and loss.

I am not referring only to large-scale producers, but to small producers as well. For instance, I recently heard of a small manufacturer who, over a period of years, bought three manually-operated tube fillers. He recently bought a fourth, although he now has the production to justify one automatic filler which would cut his labor costs in packaging at least 50 per cent. Because of his failure to recognize packaging costs, he is substantially holding down his profits.

Some years ago the Packaging Institute made a study covering 117 products that showed the percentage of the direct labor dollar devoted to packaging ran up to 87.8 per cent, and even in the highly mechanized food industry it ran up to 59.4 per cent. This certainly doesn't indicate that the production problems of packaging are behind us and that our only problem is to sell more packaged merchandise.

Packaging cost should not be regarded as a necessary evil which can't be cut. Packaging costs are a part of production costs, and can and should be lowered. — A. J. R.

PACKAGE engineering

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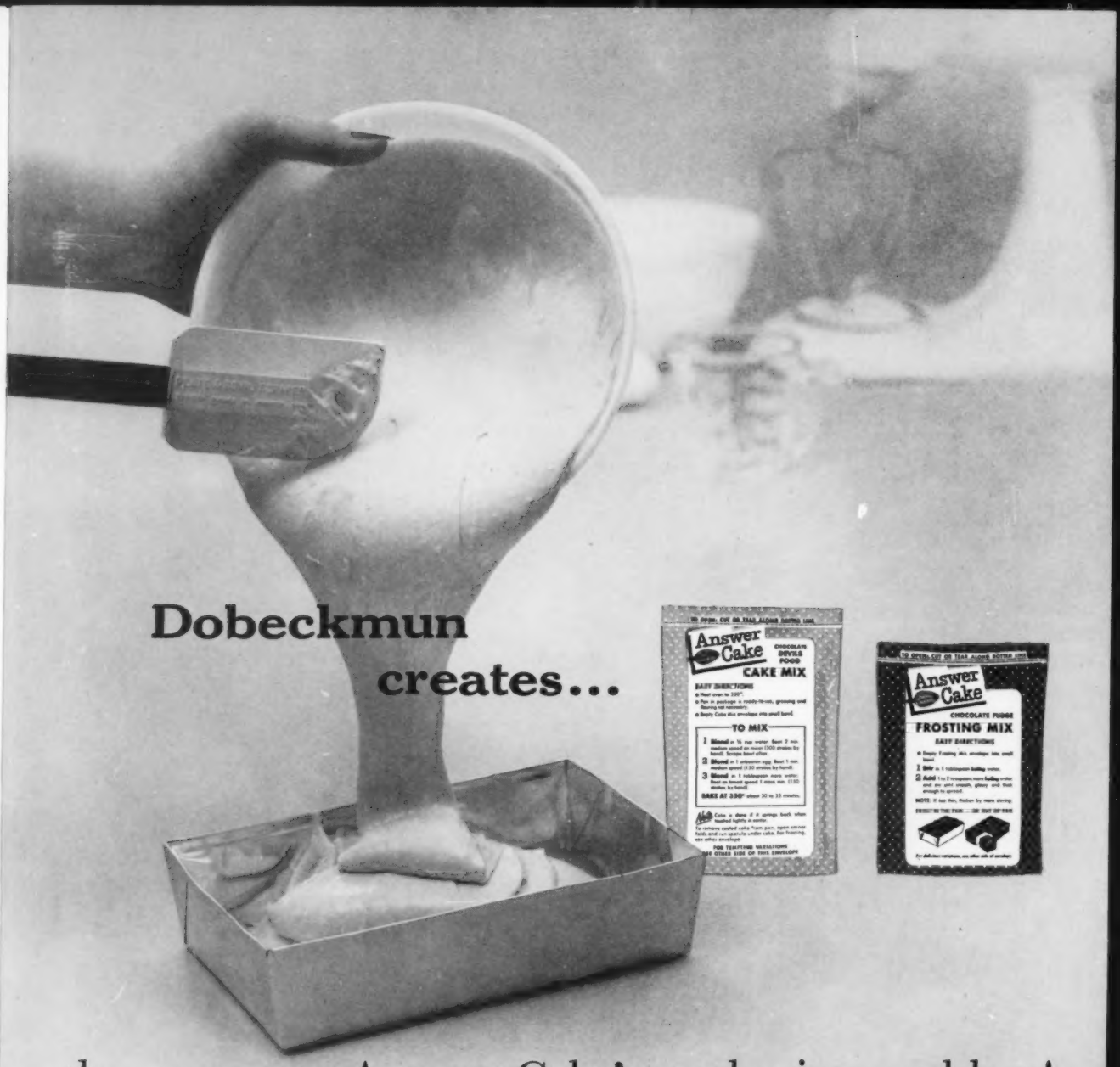

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Here is a thought-provoking discussion of many basic aspects of carton specification and manufacture. Mr. Balkema's observations not only reflect the fine points learned only through long experience, but also direct attention to problems whose answers are not yet clearly established.

Let's look at some unsolved folding carton problems

By E. H. Balkema,
General Purchasing Agent,
Colgate-Palmolive Company, Jersey City, New Jersey

E. H. Balkema has been with Colgate-Palmolive since 1942 and general purchasing agent since 1946. Prior to that time Mr. Balkema was with a firm of industrial engineers specializing in paper, printing and packaging. Before that, and following his graduation from Purdue University he was an industrial engineer for W. F. Hall Printing Company. He is vice president, director, member of the executive committee and chairman of the technical operations committee of Packaging Institute; a member of American Management Association's packaging council, of TAPPI, and of New York University's advisory committee on quality control for the graphic arts industries.

A housewife who picks up raisins, rice, macaroni, detergent or tooth paste in a folding carton is not likely to think of the multitude of instructions that were issued to many people in order that the folding carton could be delivered to the packaging lines. Nor is she likely to think of the many problems encountered by the operators of those packaging lines in order that she might have a package that sold satisfactorily and was delivered to her. She has a package that does not leak.

It does not break en route to her home. The printing is still readable, the package is still intact, and the inks are not scuffed or faded. If she opens the package with wet hands, the inks should not bleed or change color. Moreover, this package may have provided the impulse, in the first place, which caused her to make the purchase. If the design was attractive and the printing job good, it may have created that important "take-me-home-appeal".

PRECISE INSTRUCTIONS. In order that she may have this package it was necessary to issue exacting instructions to the ink manufacturer, the board mills, the artist, the photo engraver and electro-typer who made the printing plates, the folding carton manufacturer and the shipping container manufacturer. It was also necessary to issue exacting instructions to the factory personnel packaging the item in order that all the units of the same item would be assembled properly and efficiently.

Some of the problems of this last group will be discussed herein. It must be remembered that the operators responsible for getting out production are not thinking of the esthetic value of the package — they are primarily thinking of their own problems of getting the folding cartons through the packaging lines and on their way to the customer. These packaging lines may be considered as hungry monsters that thrive on a correct (for them) diet and refuse to produce on a diet not to their liking.

NEED UNDERSTANDING. These machine operators know their machines but usually this knowledge is rather incomplete. They can tell you whether a folding carton runs well or not, but many times they cannot tell you why it runs well or not. They are not alone in this, for the same applies not only to the folding carton manufacturers but also, in the larger companies, to the people who develop

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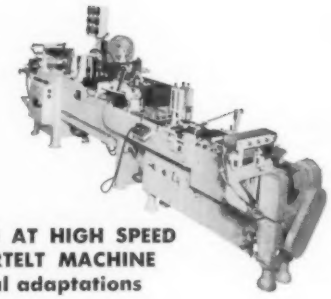

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the packages. It also applies to the manufacturers of the components of the packaging lines.

Now that we have shown that the production of good folding cartons is a cooperative adventure, let us consider some typical gripes of the machine operators and their supervisors who are responsible for getting out the production.

Board Stock

This is the start of all folding cartons, the base from which we must all work. But how about uniformity? Stocks from different mills or from different runs on the same mill act differently on the production lines. The base ingredients, especially the waste paper, vary. The treatment of the stock and the printing surface is not the same. The caliper, weight and stiffness are also at variance. Weak liners, principally the back liner, contribute to the problem especially when the glue lap pops open or the drag of the glue rollers tears the glued end folding carton at the glue lap.

SEEK UNIFORM BOARD. These are some of the reasons why those hungry monsters we call packaging machines get indigestion and "gold brick" on the job. What is the answer to this problem? Is it better quality of board and, incidentally, what do we mean by better quality? Many production people believe that the answer is uniformity of board within reasonable limits. They define reasonable limits as being those limits acceptable to the packaging machines.

Many of these same production people will also say that if they could get a consistent uniform board stock of a given grade from all suppliers, they could set their machines to perform on that stock. This latter approach has a lot of merit.

Level Stacking

A second gripe of the filling machine operators is based on how the folding and gluing machine operators roll down the number two and number four score lines on side seamed folding cartons. It is remarkable how often this detail can be overlooked or entirely disregarded. If the 180-degree folds are not properly controlled, the machine operators can expect and usually encounter trouble in feeding the folding cartons into high speed production filling machines. This is caused by a build-up of pressure along one edge of the cartons on the feeding rack.

EVEN STACKING HELPS. Some machine operators believe that if cartons are stacked evenly in a vertical pile and the result is a stable pile, no trouble will be experienced in feeding the cartons into the packaging machine.

Proper Scoring

Let us next consider the scores on cartons. The formation and prebreaking of the vertical scores is as important for hand filling as for machine filling. Some buyers specify that all score lines parallel to the glue lap must be prebroken. This can be done on the folding and gluing machine, at little if any extra expense, and will materially add to the ease with which the hand packer or the packaging machine can handle the folding carton.

SPECIFY PREBREAKING. The number two and number four score lines (Fig. 1) are broken 180 degrees in order to pack the glued folding cartons. It is good practice to specify that the number one score or glue lap should be prebroken 180 degrees and the number three score should be prebroken about 160 degrees.

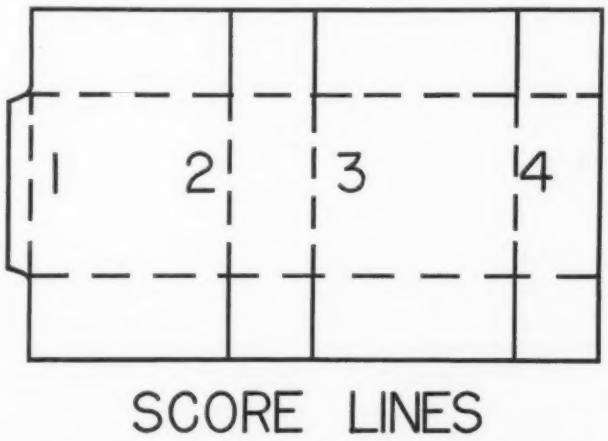
As these prebreaking operations are performed by the folding carton manufacturer, he is forced to produce cartons with good vertical lines that, when folded, will have a proper bead. If he fails to do so, the outer liner will usually crack, thus producing a bad looking carton.

PROPER FORMING VITAL. But what about the horizontal score lines? These are of primary importance to the machine operators who must use the folding cartons on their packaging machines. Such score lines should be formed properly so as to separate the plies and weaken the stock, and thus permit a clean fold along the score line when used in the packaging operation.

Improperly formed horizontal score lines result in a bend rather than a clean fold, and will cause glued end folding cartons to tend to open, due to the spring in the stock. Similar troubles are encountered with tuck-in flaps when the score lines are not properly formed. They also result in lower operating efficiencies and higher operating costs.

Problems To Solve

The folding carton manufacturers, in order to get good scores, usually places those scores across the grain direction of the board. Therefore, the scores, used by the packaging machine operators, must run with the grain. These can be of very poor quality although, with proper care,



1. In order to pack the glued folding cartons, No. 2 and No. 4 score lines are broken 180 degrees. The No. 1 score (or glue lap) should be prebroken about 180 degrees and the No. 3 score should be prebroken about 160 degrees, according to Mr. Balkema.

good quality scores can be produced.

WOULD REVERSE WORK? Then, why not reverse the grain in the folding carton and let the carton manufacturers work with the difficult scores, and let the packaging machine operators work with the better scores? At present, few folding carton manufacturers would agree with such a suggestion.

They would encounter trouble in properly folding on the score lines and obtaining a square carton, cracking of the score lines, "ropey" beads and other defects. Therefore, the packaging machine operators can continue to expect to be called upon to work with the second best scores. Any help that can be given to these operators, in their improvement, will be greatly appreciated.

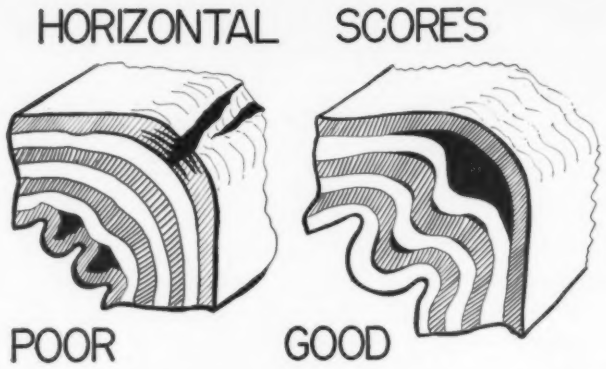
WHAT IT TAKES. What is a proper horizontal score line? To me, it means a score (Fig. 2) so made that it will cause a ply separation of the board stock which will permit a clean fold with a rounded bead on the inside, and no cracking of the outer liner.

If a cross section is cut from a squared carton at the score line, it will be noted that the part of the board stock which forms the bead is pulled away from the outer plies, thus releasing strains on the outer surface and its tendency to crack. Usually, one or more holes can be seen at the score line where this ply separation takes place. This kind of a score increases production and reduces costs.

Gluing Ends Of Folding Cartons

Some time ago, it was my privilege to pursue this subject with board mills and glue manufacturers. The reason was that machine operators were having sealing trouble that they were unable to overcome.

WATER DROP TEST. Samples of good and bad sealing cartons were collected from the packaging lines and tested. The test we used was to allow a 1/25 cc drop of water to drop from a height of three inches onto the front and back of the board stock, and then record the time for the drop of water to be absorbed into the board.



2. A proper horizontal score line is one that is made so that it causes a ply separation of the board stock which permits a clean fold, with a rounded bead on the inside—and no cracking of the outer liner, as seen at right. Score at left reveals this cracking of the outer liner.

The results of tests showed that it was possible to have two cartons with the same tests, with one sealing properly and the other very poorly if at all.

TIME VARIANCES. In our visits to the board mills, we found that each mill used a similar water drop test, but that the time allowed for a measured drop of water to be absorbed varied from mill to mill. There seemed to be no agreement as to what should be the standard time. Only one mill had made a board to fit the glue to be used.

In our visits to the glue manufacturers, we could find no manufacturer who made a glue for a specific board. It seemed that they had a multiple range of "shot-gun" formulas which should cover the range of any board that could be made. Yearly, they received thousands of samples of cartons, and are expected to prescribe the right glue to seal that carton. And then, that same glue is expected to seal the next delivery of cartons to be fed through the packaging machine.

TRY SIMPLE GLUE. We thought we might have the answer to the problem if we could test the cartons with a simple glue in our laboratory, and then tell the machine operator what formula of glue to use with that batch of cartons. Needless to say, the results were very discouraging.

So we referred the problem to the board mills and the glue manufacturers. They have spent considerable time in its study. The results, to date, are nil. We still do not have any method by which we can test a carton and determine the correct glue to be used on any given packaging line.

What do the machine operators say about this problem? Many times they will tell you that if they could get a consistent, uniform board stock from all suppliers, they could set their machines to perform on that stock with an adequate glue. In this observation, they are joined by many of the glue manufacturers who could then develop a glue for a specific set of conditions.

Belly Of Cartons

Another gripe of the machine operators is non-uniformity of the belly of a folding carton. This gripe is prevalent in the packaging of powders and similar products. The heavier the specific gravity, the more serious the problem.

This problem is not serious in the packing operation of the individual packages. It rears its ugly head when you try to put the individual packages into the shipping container. With little belly, a loose fit is obtained. With excessive belly, it is almost impossible to get the individual packages into the shipping case.

CONTROL WITHIN REASON. What are the reactions of the machine operators? Many will tell you that they realize that a belly of a carton is something that they can expect. They do not ask that it be eliminated. All that they ask is that it be controlled not only within a delivery

(Continued on Page 31)

Know your packaging costs

John W. Kraus has been associated with Thompson Products since 1941, joining the firm after his graduation from Massachusetts Institute of Technology with a degree in general engineering. His work has concerned him with packaging since 1943 and he has been in his present capacity since 1947. He is chairman of SIPMHE's national educational committee and is both a national director and a director of the society's N. E. Ohio Division. Mr. Kraus is a member of the preservation, packaging and packing division of American Ordnance Association, belongs to a similar committee of Aircraft Industries Association, is a member of American Society for Engineering Education and of the Cleveland, Ohio, and National Societies of Professional Engineers.

By John W. Kraus,
Section Supervisor,
Quality Control & Packaging Engineering,
Accessories Division,
Thompson Products, Inc.
Cleveland

Problems and procedures entailed in determining and allocating packaging costs constantly plague many companies. In this article, Mr. Kraus outlines the practices of his organization, and explains the use of the Thompson forms — as a tool of packaging cost determination.

The method of accounting for packaging costs has long been a controversial subject. Many companies consider the packaging department to be an overhead or indirect labor department and apportion its costs along with other overhead such as intra-plant trucking, plant maintenance, plant guards, personnel service, etc. Others have held that the cost of packaging should be included in the individual cost of each product as a direct cost necessary to convert it from raw materials into an object useful to the customer.

The practice of considering packaging costs as overhead may lead to problems in pricing, especially in highly competitive fields and where products which vary greatly in packaging cost are involved. As example, consider a firm manufacturing two assemblies having equal costs and sold for equal prices. Item A is light, of relatively simple shape, and can be packaged in an inexpensive corrugated carton. Item B is heavy, irregular in shape, and must be crated. To package Item A costs $1.00; Item B, $7.00.

EFFECTS ON PRICES. If these costs are considered as overhead and apportioned to the two items in the ratio of item cost, as is frequently done, each assembly will carry $4.00, since we have postulated that the other costs are equal. This will result in over-pricing A by approximately $3.00, and under-pricing B by the same amount, and may result in making A noncompetitive with similar products of other companies. Also, should A be taken off the market for some reason, the company would no longer pick up enough from the sale of B to cover the cost of packaging it, at least until burden factors and standard costs were recalculated.

Frequently the reasons for putting packaging costs into overhead are the lack of personnel competent to determine these costs, or that there is a job-shop type of operation where no two products are alike.

Getting Standard Costs

Where the product is one which is produced repetitively, it is a relatively simple matter to develop a standard cost for packaging it. Where there is only one method of packaging for any single item, the bill of packaging materials and the standard labor cost can be shown on the routing sheet or other cost development form used to establish the overall cost for the item.

In the case of articles manufactured repetitively, but to which *several* methods of packaging may apply, a more flexible system may require that *separate* bills of packaging material and standard labor costs be set up and that the overall cost of packaging, for whatever method is specified on a particular

Turn page over

order, be added to the cost of the material as a separate item.

CHOICE OF METHOD. This is the method which is in use by the Accessories Division of Thompson Products for major components. For any single item which we manufacture, we may have to use one of three packaging methods. Shipments to engine and air frame manufacturers for their own use are generally packaged in what we call our commercial pack. Shipments to military depots can be packed either with special preservative methods for the interior or unit package and with domestic type outer containers, or they may be packed with the same interior preservation but with export type outer containers. The cost for each of these three may differ appreciably from the costs of the other two methods.

How We Use Forms

Four basic forms are required so that we may set up our packaging specifications and cost analyses for any of the major assemblies which we manufacture. The first two forms, which show the numerical series for master specifications, and the master specifications for the six general types of containers are used for control purposes only by the packaging engineering group, and are not distributed to other departments.

The commodity specification sheets and the packaging specification and cost analysis sheet are distributed to the accounting, industrial engineering, inspection, packaging, planning, purchasing, sales, and supply stores departments.

DETAILS ENUMERATED. This system, which has been in use in its present form for approximately one year, first breaks down the master specifications into six series, depending on the general type of unit container involved (Fig. 1). We define the unit container as the most inner container which bears identifying information as to content. The use of four numerical digits facilitates the use of accounting machines for scheduling the purchase and issue of packaging materials.

Each number within any one of the six series (Fig. 2) represents a specific pack based on one of the unit containers in the general class represented by the series, and which may be used for from one to a large number of items.

USE OF NUMBERS. When a new assembly is to be packaged and it is found that a current specification can be used, but with modification, a new number must be assigned within the series so that the cost of the modified materials will be correctly picked up. Where no modification is required, the number of the appropriate current specification is assigned.

Numerical Series For Master Specifications

1000 Series	Corrugated & Cleated Corrugated Boxes
2000 Series	Fibre Boxes
3000 Series	Set-up Boxes
4000 Series	Folding Boxes
5000 Series	Reusable Exterior Metal Containers
6000 Series	Interior Metal Containers

1. As part of system of specifications which Thompson Products uses in getting packaging costs, there is a numerical series which breaks the master specifications into six types. As shown in this listing, the six categories break down on a basis of type of unit container involved.

Master Specifications — Corrugated (1000)

1001	473
1002	485
1003	490
1004	495
1005	501
1006	502
1007	503
1008	504
1009	505
1010	510
1011	515/485 IIb/D
1012	515/485 IIb/E
1013	516
1014	521
1015	522
1016	525
1017	526/503 IIb/D
1018	526/503 IIb/E
1019	527
1020	529
1021	539/504 IIb/D
1022	539/504 IIb/E
1023	595
1024	597
1025	462
1026	400
1027	404
1028	257 Std.
1029	257 IIC/D
1030	257 IIC/E
1031	450 (See 4700)
1032	
1033	
1034	
1035	

2. Within a series, each number represents a specific pack based on one of the unit containers in the general class represented by the series. Each of these specific packs may be used for a varying number of items — from one to a large number of different items going into this pack.

What Forms Contain

The commodity specification (Fig. 3) shows in the first column the part number assigned to each of the assemblies in the commodity for which a standard packaging method has been developed. In the next three columns are shown master specification numbers for the commercial, preserved-domestic, and preserved-export packs.

On the packaging specification and cost analysis sheet (Figs. 4a,b,c) are found: In the first column, material specification numbers; in the second column, standard cost for the material; in the third column, the number of assemblies or parts that can be packaged in the specified amount of material; and, in the fourth column, the extended cost per hundred units of the part being packaged.

TOTAL HOURS SHOWN. In the heavily outlined boxes at the end of each section are found the total hours per hundred pieces for labor, as furnished by the time study section of our industrial engineering department, and the total material cost required to pack a hundred units. This

Packaging Specification — Commodity 53

F. R.	Master Specification Number		
	Commercial	Preserved Domestic	Preserved Export
12900-6	1002	1011	1012
12900-7	1002	1011	1012
13400	3003	6029	6030
13400-1	3003	6029	6030
13900	1002	1011	1012
27300-6	1002	1011	1012
27300-8	1002	1011	1012
27900-10	1002	1011	1012
28300-2	1002	1011	1012
28300-3	1002	1011	1012
28300-6	1002	1011	1012
28300-7	1002	1011	1012
28400-4	1003	5006	5006
28400-5	1003	5006	5006
28400-7	1003	5006	5006
29600-1	1003	5010	5010
29700-1	1003	5001	5001
29700-6	1003	5010	5010
29700-8	1003	5006	5006
29800-1	1001	5005	5005
30200-4	1002	1011	1012

3. Commodity specification shows a number of details: In the first column is the part number assigned to each of the assemblies in this commodity — for which there is a standard packaging method. The next three columns show master "spec" numbers for commercial, preserved-domestic, and preserved-export packs.

form is divided into three general sections with space at the end of each for these cost totals, each section representing one of the methods of packaging mentioned above.

In order to find out how much it costs or what materials are used to pack any particular assembly, reference is made to the commodity specification sheet. Here the assembly number is picked out in the left hand column and the master specification number, for whichever of the three methods of packaging is being studied, is found in one of the three columns to the right.

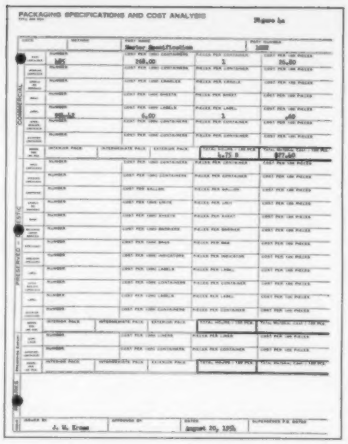
One then turns to the packaging specification and cost analysis sheet bearing the master specification number found, where can be found the method to be used, the materials required and their individual or total costs, and the number of labor hours which will be needed.

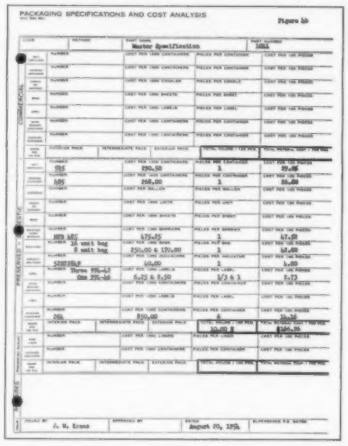
Packaging specification and cost analysis sheets are used to determine the amount of each type of packaging material which must be requisitioned periodically; they are the packaging specification to which the packaging department works, the specification which guides the inspection department in its surveillance of the work done in the packaging department, and they are also used for establishing costs by the accounting and sales departments.

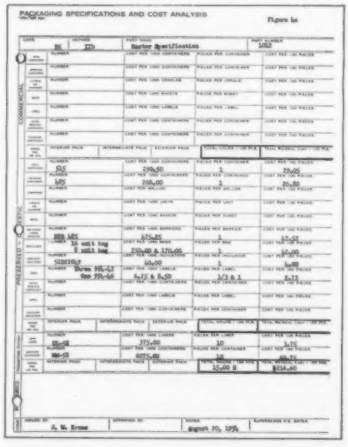
Handling Small Parts

It is sometimes impractical to establish individual costs for packaging small parts where these are a relatively small factor in the overall operation of an industrial unit. This is the case in our division regarding the many small parts, bits and pieces which constitute the spares used by our customers for repairing or overhauling our assemblies.

As is true in many companies engaged in the type of work which we do, we have used an averaging method to establish a representative packaging cost. This cost is set up as a percentage of the invoice price for each part, and applies as a surcharge only when preserved-domestic or preserved-export packaging is specified. It is evident that where a


PACKAGING SPECIFICATIONS AND COST ANALYSIS


PACKAGING SPECIFICATIONS AND COST ANALYSIS


PACKAGING SPECIFICATIONS AND COST ANALYSIS

4-A, -B, -C. These three examples illustrate the methods and practices outlined in this article and show how they work out when applied to representative items. First column shows material "spec" numbers; second column, standard cost for material; third column, number of assemblies or parts that can be packaged in the specified amount of material, and fourth column, extended cost per hundred units of the part being packaged. Heavily outlined boxes show total hours for labor, total material costs per hundred units.

single per cent is used to cover anything from a precision made complex part to a piece of standard hardware or a gasket, the cost assigned to any one part may not be at all representative of the cost of materials and labor involved.

THIS PROBLEM GREW. When the spares program was a small part of our business, this did not affect our overall picture appreciably as long as the orders we received were in approximately the proportions used in establishing the cost percentage. However, our spares program has grown very considerably and is a significant portion of our total business today.

While we still do not believe that in most cases we would be justified in spending the time to establish costs for packaging individual spare parts, we are seriously thinking of categorizing our parts into some type of cost group to which different representative percentage factors may be applied. This, in effect, is a step in the direction of applying individual packaging costs to each spare part, and should result in greater accuracy with less dependence on the proportion of costly and inexpensive parts in any order.

Treat As Direct Cost

The degree of accuracy and the amount of detail which can be applied to the establishment of packaging costs vary with the organization of a company, the specialized training of its personnel, and the product which it manufactures. Generally speaking, however, packaging costs can be determined sufficiently accurately to permit their inclusion as a direct cost of a product where they can be more closely watched and controlled than is possible when they are simply regarded as a part of the operating expense of a manufacturing unit.

Since packaging costs may run anywhere from a fraction of one per cent to, in some cases, considerably more than 100 per cent of the cost of the product being packaged, they constitute a fertile field for cost control and reduction by progressive company management.

Riding this conveyor battery is a steady flow of 5000 pounds of fig bars an hour — which these packaging line workers must handle. Leaving the belt these bars go through a stacker which delivers them in rows to the packing stations. Topmost conveyor carries empty corrugated cases used for bulk packing of fig bars.

Down to just two rows on each side of the line, the rows or channels of fig bars reach the last packing station — where the girl (foreground) inserts them into cartons. Separators are magnetically-held metal guides. Bottom (belt) conveyor carries fig bars, center one carries filled cartons and top one moves out bulk production.

Making packaging shifts fit flow of production

By R. Bruce Holmgren
Editor, Package Engineering

To package a steady flow of fig bar production in spite of frequent wrapping machine stoppages for change-over, the Baking Division of Zion Industries, Inc., Zion, Illinois, has developed a way to take care of this production: As soon as a wrapper stops for a change, the packers switch from individual carton to bulk container packing—then resume carton tray handling when the change-over is complete.

BARS KEEP COMING. After 350 feet of oven travel and 900 feet of conveyor belt movement, these fig bars (which by now are at room temperature) pass to the packaging stations. Without let-up during the operation of the oven these bars keep moving to the packers—at a rate of 5000 pounds of fig bars each hour. Crux of the packaging problem is the job of packing these bars—with no opportunity for backlogging or accumulation.

MANY PACKAGE CHANGES. Further, Zion Industries not only packages different carton tray sizes under its own label but also does a large volume of private label work. This means that not only wrapping machinery but also carton forming units are subject to frequent chang-over. Package sizes include 12-ounce, one-pound, 20-ounce, 24-ounce and two-pound units. Whether for a wrapping material change or a carton size change, there is a change-over time of roughly ten minutes.

SWITCHING TO BULK. Ten minutes is a long time when a solid flow of fig bars keeps on coming, especially when it is impossible to let them accumulate on backlogging conveyors. Therefore, the packers on the line being stopped for change-over switch to bulk packing during the interval of line stoppage. This rapid alternation of packing is possible because of the design of facilities and conveyors serving the packaging operation. Thus, packers go from individual packaging to bulk packaging (and back again) without hesitation.

CONVEYOR LAYOUT. Fig bars themselves move down a belt that is part of the Baker-Perkins stacking and delivery equipment. Just above this belt is another belt conveyor—which carries loaded carton trays to the wrapping machinery. Still higher (but within easy reach of packers

Specially designed packing stations permit each packer to work with top speed. Metal rack at left holds supply of empty cartons delivered to each station from Kliklok equipment. There are four stations regularly used on each side of the belt, plus two that are held in reserve to meet special needs. Note that design of station facilitates cleaning, due to ease of getting underneath it.

Packages go through or bypass these two wrapping machines. Because of frequent size and material changes wrapping machines are out of production — for about ten minutes for each change. During this interval the packers fill bulk containers with fig bars. These cases move to conveyors (seen in background) leading to case sealers. Portable conveyors permit easy connecting with or bypassing of wrapping machinery.

at their stations) is a long horizontal chute-type conveyor which is an extension of a gravity conveyor from the floor above. On this ride empty cases for bulk packing. On the floor above, attendants form and staple (bottom flaps) these bulk containers and insert in them the liner paper.

BATTERY OF STATIONS. On each side of this line of belts and conveyors are four packing stations regularly used and two more which are held in reserve—to meet special needs and unusual loads. Each station has a specially-built rack. This, like the conveyors themselves, is the design of Zion's own engineers and executives. Each rack is suspended from the main table of the line so that it protrudes laterally. There are no legs or supports under it—thus making it easy to keep the floor clean below the rack.

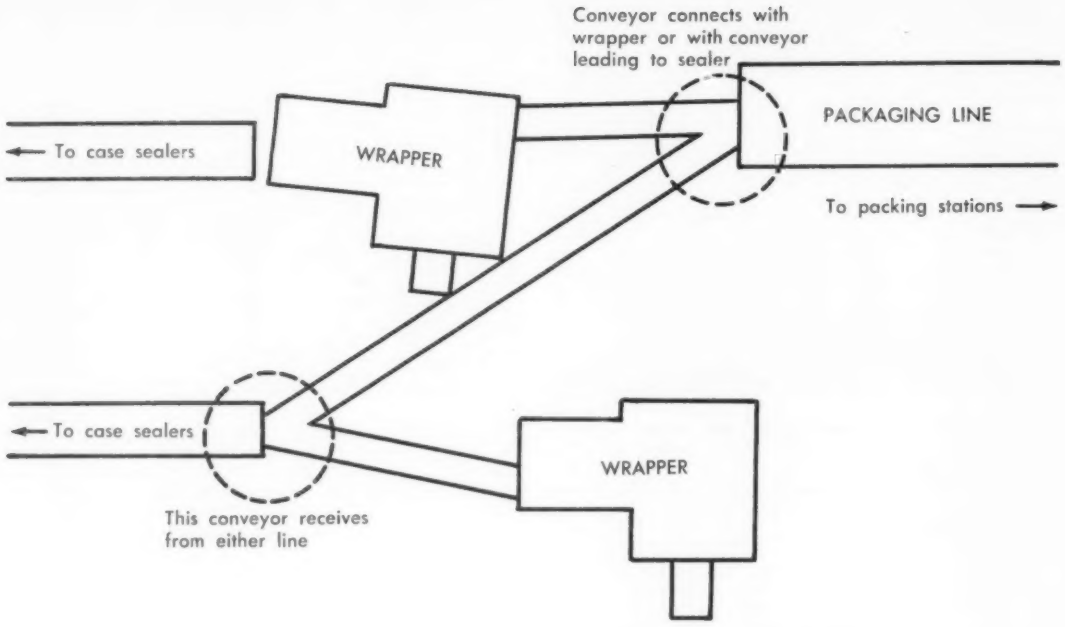
USE OF GUIDES. Each rack has an angled surface—to permit holding either bulk cases or racks of individual carton trays for the actual packing operation. There is a stock attendant for each side of the line (four stations each side) who keeps packers supplied with materials. Metal forms hold supplies of formed carton trays; the stock attendants deliver these loaded forms to the packers—who remove carton trays as needed.

FORMING OF CARTONS. The Baking Division's plant has a battery of three Kliklok units to form carton trays of the various sizes being used. An important phase of maintaining a continuous packaging operation is the careful scheduling of carton forming. The flow of fig bars does not allow time for carton forming. Therefore, close planning assures that adequate supplies of a particular size needed are formed and at hand — well in advance of the moment of use. Similarly, scheduling demands close timing to allow sufficient time for Kliklok machine change-over.

BARS MEET CARTONS. Leaving the 900-foot length of belt travel, fig bars move through the stacker which transfers them from horizontal to vertical position. They stack up in twelve rows, separated by magnetically-held metal guides. These twelve reduce in number as they pass each of the packing stations—since the terminal point of a row is the place where a packer takes off the fig bars to put them into a waiting carton tray.

PREPARING TO WRAP. Thus packers

Here is what happens when you have a steady flow of product and frequent interruptions of your packaging material: The Baking Division of Zion Industries, Inc., faced just exactly that problem with its fig bar operation. This story tells how Finley Leech, production manager of the Baking Division, found a way to take care of the fig bars (they just keep coming) while his wrapping machines get their change-overs. Mr. Leech's solution of his problem emphasizes the importance of coordinating equipment, scheduling and methods.



Equipment Positions and use of portable conveyors make it easy for crew members to switch to and from wrapping machines. Since there is no let-up in fig bar production the packaging operation must take away these bars. Therefore, packers load bulk containers (which bypass wrappers and go directly to case sealers) while wrapping machinery goes through change-over.

remove the stacked fig bars from each row (some packers are so skilled they handle two rows at once) and insert them in the carton trays. They place loaded carton trays on the conveyor belt leading to the wrapping machinery. This is the middle conveyor; it is located just above the belt on which fig bars ride and just below the conveyor holding cases for bulk loading. On this middle belt, not only individual packages but also bulk cases move away from the packing stations.

OVERWRAPPING DETAILS. There are two Package Machinery wrapping machines, each equipped with electric eye registration of printed film. These machines automatically overwrap each carton tray with cellophane—printed with Zion copy or with that of Zion's private label using customers. Production from these machines go into shipping cases which in turn move by powered and gravity conveyors to the battery of J. L. Ferguson case sealers.

COMPLETING OF CASES. Here, cases of individual packages of fig bars go through top and bottom sealing operations. Bulk cases merely receive top sealing since the bottom flaps were stapled prior to these cases reaching the packaging floor. Because of the arrangement of conveyors these sealing units also serve production coming from other areas of the plant, in addition to the fig bar production.

BULK OR UNITS? The Baking Division plant has developed a way to bypass the wrapping machinery during intervals when the main packaging line is handling bulk cases. Connecting conveyors are portable so that they either connect the main line and the wrapping machinery or provide a direct flow from the main line to the powered conveyors leading to the case sealers. These latter conveyors form a U-shape. Thus, the fig bar packaging line is one leg of the U and the case sealers form the other leg—parallel to the fig bar line. Leaving the case sealers the completed cases move to storage pending shipment—as does other production of the plant.

ENGINEERING THE JOB. Although this operation uses standard stacking equipment and table as well as standard models of wrapping and case sealing machinery, the plant did much work of its own. Finley Leech, production manager, and members of his staff had to work out a system of conveyors of their own—to meet the unusual needs of fig bar packaging. A parallel consideration contributing much to the efficiency of the operation is the system of scheduling—which makes possible the alternating of unit and bulk packaging.

Editor's note: Although manufacturers of packaging machinery are prompt to apply their engineering ingenuity to the solution of new or special problems, it often happens that a user of machinery comes up with an innovation of his own. This article tells how a production manager solved a problem of bottle cap appearance.

Here is a concise case history of production problem-solving on the spot. A switch of caps brought with it a new problem — which company plant personnel solved through practical experimentation.

How Campana prevents discoloration of its white bottle caps

When Campana Corporation, Batavia, Illinois, cosmetics and pharmaceutical manufacturer, switched from black to white stock caps for its bottles of Italian Balm, it faced the problem of color transfer: Black, coming from a capper and a labeler, started appearing on the caps. A systematic investigation led W. K. Schwarzburg, production manager, to a solution of the problem.

Now, by using amber rubber instead of the black for the tightening rings of a Resina capper, and by using specially-developed Insurok hold-down pads on a Pneumatic Scale labeler, Mr. Schwarzburg no longer has this problem, of the black scuffing or marring the white surfaces of bottle caps.

Solving Capper Problem

Starting with the capper, Mr. Schwarzburg and his staff tried several proposed solutions. First, they tried rubber of red, rather than black, for the tightening r gs. This resulted in a transfer of the red color, just as the black had been transferring. Next, they tried the amber rubber and found it satisfactory.

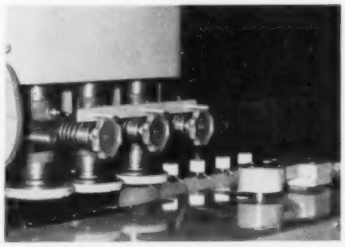
Although some transfer of color actually takes place, this is virtually imperceptible, Mr. Schwarzburg explained. The amber rubber is an extremely light amber. It gives no appearance problem because, for all practical purposes, whatever transfer takes place is like white going onto white, he observed.

Changes At Labeler

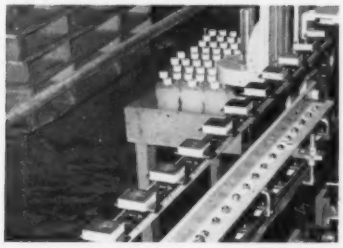
Close examination of the labeling of bottles revealed that scuffing or discoloration of caps was taking place at the hold-down pads of the labeler. First effort at a solution of the difficulty entailed use of white tire patching material. The caps cut this material rather badly, thus rendering it unsatisfactory.

Experimentation led Mr. Schwarzburg to the use of Insurok, a laminated board with a hard surface. Using this material, the Campana plant technicians cut pieces to match the hold-down pads they wanted to replace. They tapped these for threads and screwed them to the labeler chain. After two such pieces worked satisfactorily they made pads for the entire chain.

Previously, the plant men had removed the labeler's steel plates, to which black rubber was vulcanized. Doing away with the steel plate, they installed the Insurok pieces at Mr. Schwarzburg's direction. Now, there is no more scuffing or discoloration of bottle caps; the new pads have solved the problem.



Use of amber rubber for the tightening rings of this capper enabled Campana to solve its problem of unwanted color transfer. Because this type of capper involves tightening caps by friction, the black rubber (formerly used) transferred to the white caps. Red rubber did the same thing but the amber rubber proved satisfactory.



These Insurok pads not only replace the rubber hold-down pads previously used on this labeler but also do the job without transfer of color, without scuffing, and without making an unduly tight hold on each bottle. The Insurok is not vulnerable to the pattern-forming wear (in one spot) of a design cap which Campana uses. It holds the capped bottle adequately but permits necessary lateral play.

Other Benefits Gained

There is no problem due to thickness, as the thickness of the standard Insurok sheet proves satisfactory. There is sufficient vertical adjustment leeway possible to compensate for any variations or tolerances that arise. Formerly, with the rubber pads (and a design cap which Campana uses) the design cap tended to work a pattern into the hold-down pad, so that a bottle was held in that position.

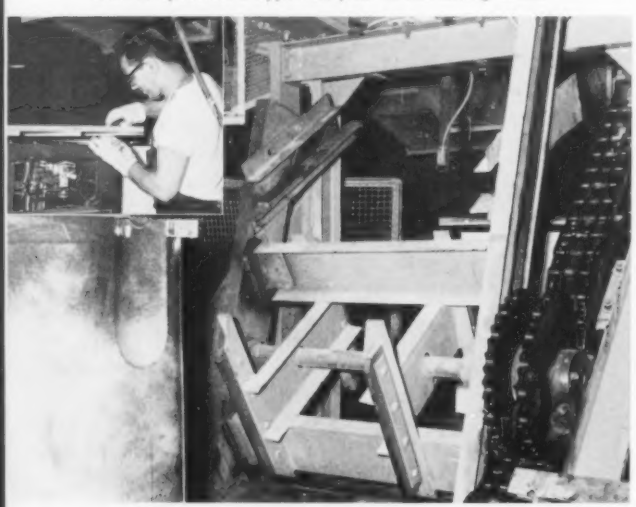
As a result, there was insufficient tolerance for lateral movement, which takes place on the conveyor chain at the wiper station or pressure station. The bottle required a slight movement but was held in tight position at the hold-down pad. Now, there is not only enough play for lateral movement but also enough tightness to hold the bottle adequately during labeling, Mr. Schwarzburg explained.

We put Hotpoint home laundry equipment into corrugated packaging

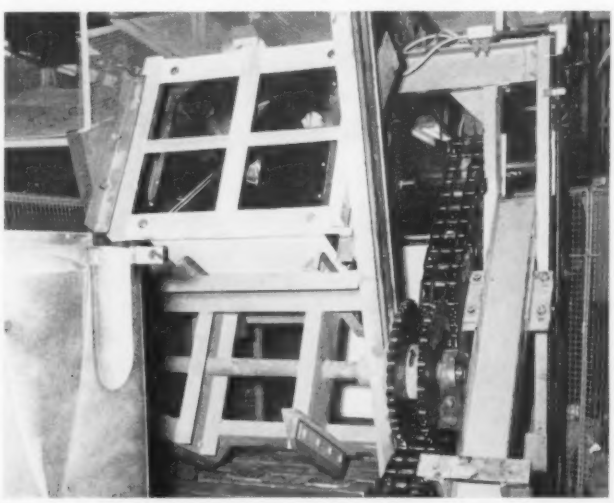
By Edward Zelinski
Packaging Engineer
Hotpoint Company
Chicago

Here is a practical approach to the combining of (1) new and specially developed machinery, (2) a new conveyor and packaging line layout, and (3) a corrugated package. In this article a veteran packaging engineer tells just how to coordinate equipment and methods — to put a brand new package into full-scale production.

This turn-over device (of Hotpoint's own development) transfers each appliance 180 degrees, setting each down on chain conveyor slats. Here, unit is empty — to show holding action that takes place during a turn-over, using the rail-like guides. Inset photo reveals how crews attach skids to upside-down appliance, prior to this turning action.



Making its turn-over, this appliance is moving (in counter-clockwise direction) so that it lands right side up on conveyor — to move along line as unit at far left is doing. Permanent leveling jacks rather than temporary screws secure skid to appliance. Extruded rubber pads between wood skid and metal of appliance protect finish, take shock.



By switching to a corrugated box for the packaging of our washers and dryers we have gained several important packaging advantages. These include (1) increased production rates on our packaging line; (2) substantial packaging cost reductions; (3) increased protection against shock, and (4) decreased reliance on specialized packaging line personnel —such as "left-handed" and "right-handed" nailers.

The story behind our attaining of these objectives is a case history of packaging line development and is a tribute to the effective coordination of the manufacturing engineering and the maintenance groups with the packaging personnel of our company. A nutshell summary of this effectiveness is the fact that we made our change-over in one week-end—with no loss of productive operation.

Edward Zelinski has been associated with Hotpoint for 30 years. Prior to that time he was with International Harvester Company and Western Electric Company. His engineering training is largely the self-developed result of practical experience accumulated through the years. He is a member of SIPMHE. His work with Hotpoint includes carloading operations as well as packaging.

Getting New Box

We now use a corrugated box made of 300-pound test double faced corrugated board for our washers and dryers. Along with these boxes we use triangularly-folded L-shaped corner posts of corrugated. Further, we use various types of interior packaging pieces within each box. These interior items include corrugated die-cut units, cellulose wadding and stain-resisting pressure sensitive tape.

To handle our new box we are using a case sealer, just developed by Hinde & Dauch. Installation and use of this machine involved a major rearrangement of our packaging line. In fact, we made a number of such changes following our switch to corrugated. Previous packaging for these appliances included a Watkins crate for the dryer and a wirebound crate for the washer.

MINIMIZING DAMAGE. A major objective of our packaging program is to protect the appearance and condition of the surfaces of our appliances. For this reason a feature of our new packaging operation is the use of such protective measures—not only while packages are in transit, but also while the packaging and fabricating operations take place in our plant.

For this reason the hardwood skid (we also use some soft woods) on which each such appliance rides is larger than the appliance it carries. The extra dimension facilitates removal of units from our line and prevents surface contact between units as they move down our lines.

Start Of Packaging

Actual start of our packaging

All the way over, this unit rests in upright position on the chain conveyor. Unit at right is still upside-down, awaiting movement through turn-over equipment. Note that extra wood pieces (secured to conveyor slats, which also are of wood) support machine during interval while it is resting on the center strip of the wood skid, as seen at lower left.

Moving through pre-pack operations prior to final packaging, each washer and dryer receives interior protective packaging and final assembling of components. This girl is about to pick up corrugated "rounds" which she will fold into place and secure within unit — after which she inserts die-cut corrugated members now resting on top of appliance.

operation is where each appliance receives its wood skid. At this point these partially fabricated appliances ride upside-down on a slat conveyor. Crews use leveling jacks (instead of screws or bolts) to secure the skid to its appliance. These same leveling jacks remain with their respective appliances at all times.

We use extruded rubber pads of reclaimed rubber, putting them between the actual surface of the appliance and the wood skid. These not only protect the enamel but also provide a space interval which facilitates handling and packaging of these washers and dryers. Further, they provide a cushioning effect—which is beneficial.

USE POWER TOOLS. So, our crew members position the pads and skids, then secure them to the appliance. They use air driven tools with which to secure the leveling jacks and tighten them in place. This work takes place as the washers and dryers move down our conveyor line. As noted, the appliances require considerably more fabrication and assembling prior to final packaging.

Up to the point of securing skids the appliances have been riding upside down. Now, we have to turn them to an upright position, so that they ride the rest of their conveyor journey in an upright position. To do this uprighting movement we use a specially-developed machine.

How "Uprighter" Works

Our manufacturing engineering organization developed a piece of equipment which turns each appliance 180 degrees and sets it down on its skid—on our conveyor. Essence of this operation is that our conveyor carries the appliance into this machine, which then catches it (and prevents it from falling out of position during the turn-over) and inverts it.

Focal point of the action is that a skid moves in between two openings on each side, which act as holders, something like close-fitting rails. Further, the turning action takes place in timed sequence with the conveyor. Thus, it rotates whether there is an appliance in place or not.

CLOSE TIMING. Thus, as the rotating mechanism turns the appliance 180 degrees it lowers it into timed or registered position on the wood slats of the endless chain type of slat conveyor. Purpose of this action is to get the skid properly positioned so that extra wood members, fastened to the slats of the conveyor, provide added support.

These pieces help hold the load during an interval when the appliance is resting on the center strip of the wood skid. Since the slats of the conveyor are approximately six inches wide there is adequate space on which to secure these supplemental members. Once the unit is turned over it leaves the uprighting device, moves down the conveyor for further operations.

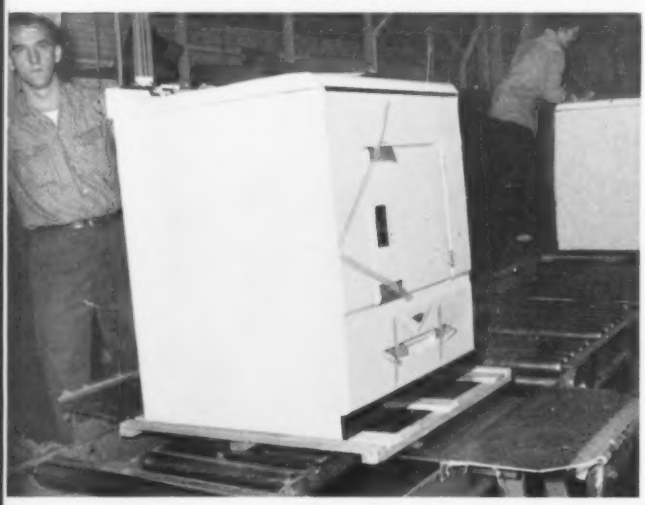
Preliminary Packaging

While each appliance rides on this conveyor our crew members not only complete the assembling of the unit but also position some of the preliminary packaging. For example, a die-cut corrugated protective unit goes into each washer to protect the spin tub during further movement on our line, prior to final packaging.

After these operations take place and assembling is more or less complete each unit moves into an elevator which carries it to the floor on which our principal packaging line (with the new equipment) stands. Before an appliance gets its corrugated box a number of interior packaging steps take place.

USE OF TAPE. One girl takes a number of strips of stain-resisting pressure sensitive tape and spots

Ready for packaging, this appliance is now at first station of case sealing equipment. Retracting plates and movable (up and down — like an inverted lift bridge) roller conveyor sections coordinate in their action to facilitate holding unit and closing box flaps — after box goes into place. Extra-wide skid protects equipment during in-plant movement.



On goes the box — with crew member slipping it into position, to prepare it for flap closing and gluing. Conveyor at this point is a dead section, to let these crew members control movement of work. Boxed unit, partially seen at far left, is moving automatically through closing equipment. Assembled and pre-packed machine at right awaits its box.

them where succeeding workers may position them. This line works progressively, so the first girl usually starts the job for the second, although there is some variation—depending on the flow of work. In any case, these pieces of tape go into place to hold doors closed, to protect appliance corners (when the box goes over it) and serve to hold the interior padding in place.

The die-cut piece protecting the spin tub comes out, rests on top, and the workers position two pieces constituting a corrugated "round" protecting the tub area. They tape these pieces in place, then replace the die-cut—within the corrugated "round" pieces. Also at this point, accessories, such as rubber hoses, are secured within appliances. In connection with the securing of doors and the like, we use cellulose wadding as needed.

Going Into Boxes

A feature of our packaging line is that each corrugated box is slipped into place—over each appliance riding by on the conveyor line. These corrugated boxes are all regular slotted containers. Supplies of boxes for the various models stand near this point of the line—just ahead of the box closing machinery.

As the box goes into place the unit is resting on the mechanism which closes the bottom inner flaps and facilitates box positioning. There is a coordinated action of retractable plates and moving sections of roller conveyor. While the roller sections are down the plates hold the skid. When the plates are retracted the skid moves on the rollers—at this time horizontal. These carry the weight of the appliance.

CONVEYOR NOT POWERED. This area of the operation uses a conveyor that is not powered. This lets the crew members working here control the flow of work. Otherwise, if we powered this conveyor the movement would not meet the varying needs of the flow of work here.

By the time crew members are ready to push a boxed unit out of this dead section and onto a powered conveyor, its outer box flaps are ready for the gluing operation. Moving on this conveyor (leading into the main section of the case closing equipment) each boxed unit meets an arm which raises and holds the front and back flaps.

ADD CORNER POSTS. Now, our crew members put in the corner posts which are triangularly folded and are made of corrugated board. These reinforce the corners within each corrugated box. Each man puts in two pads, on his side of the conveyor. From here the units move to the gluing section of the machine—to which our Hotpoint engineers added 20 feet of conveyor line.

We have a circulating system to handle our adhesive, so that we are pumping out of and back into each 55-gallon drum from which we take adhesive. Because of this circulating system we use glue of slightly higher viscosity than we would need if we had no circulating action.

Completing Packages

Next, all four outside flaps of each box receive glue at once, after which top and bottom flaps alternately are moved into closed position—through an air action. Moving arms coordinate with stationary members to close the outside flaps. Once this is done, our boxes move into a compression section to complete the packaging job.

This equipment uses floating rollers, each weighing about 30 pounds. Either five or six rollers (depending on case dimension) are on each box concurrently as these boxes go through the compression section. These rollers are not powered and merely rotate on their axes.

All four box flaps receive adhesive at same time as package moves through application station. Inner flaps are already in closed position. Next (moving from right to left) action is the closing of the glued outer flaps. There is a circulating system so that glue is pumped out of and back into the 55-gallon drums supplying the equipment.

These floating rollers, each weighing approximately 30 pounds, ride on cases passing through this pressure section. There are five or six rollers on each case at one time — depending on case dimension. These rollers are not powered. They rotate freely on their axes as cases pass through this section. Compression section is approximately 50 feet long.

FAST CHANGE-OVER. Although the new Hinde & Dauch closing machinery is basically standard as received from the manufacturer there are special features which we specified. One of these is the method of change-over. We specified a rapid means of adjusting from one case height to another, should it be necessary in the future to shift from model to model coming down our line.

Leaving the closing mechanism, these corrugated boxes containing our washers and dryers move down a powered conveyor—into our warehouse area. This conveyor enters the warehouse near ceiling level and makes a gradual descent, reaching floor level. Our conveyor is U-shaped, with one leg starting at the entry point and the other leg ending at the floor level point—near the carloading station.

Warehousing Operations

These completed packages either move straight through the conveyor line for direct loading into cars prior to shipment or they are taken off the conveyor for temporary storage as part of the warehouse stock. Our warehouse has an overhead crane with which to handle stock. We developed a special grab to permit handling our washers and dryers two boxes at a time—without damage to boxes.

The grab jaws have points which dig into the surface of the box so as to hold it without damaging or crushing the box surfaces. These jaws may be preset to operate automatically or the crane operator may control each jaw action specifically. The crane itself has full mobility of our warehouse.

Precautions Of Planning

In coordinating the installation of the new equipment with which to handle our corrugated box we benefited by following a number of important guides and precautions:

1. Careful planning of the preliminary and final layout of our conveyors paid dividends in time saved. This planning involved both the manufacturing engineering personnel—and the maintenance personnel, who did the actual installing.

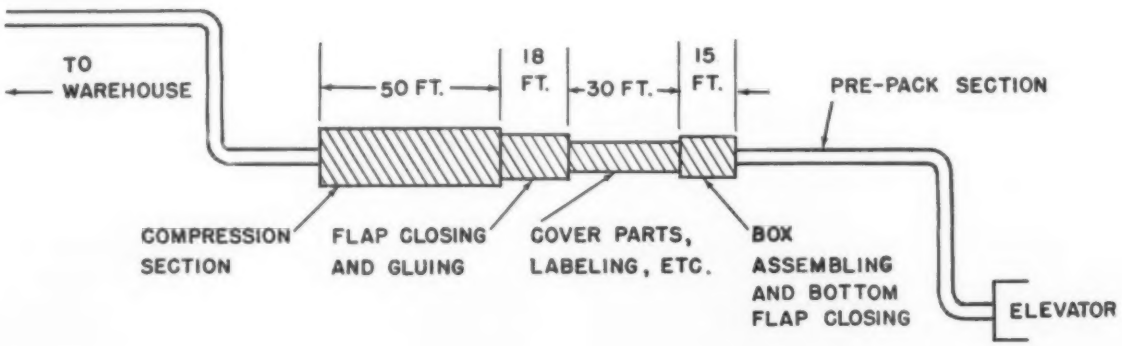
2. As usual, it proved important to bring the manufacturing engineering group into this packaging line development in apt time—so its personnel could review the packaging equipment specifications and recommend an installation and layout.

3. Likewise, it was important to bring in the maintenance group sufficiently early for its members to familiarize themselves with the new equipment prior to its installation.

4. Planning and coordination of the packaging, maintenance and manufacturing engineering groups made possible the complete change-over in a week-end. We even carried out a pilot run on this week-end. By Monday we were in full production, using our new corrugated box with our new box closing equipment.

Aside from the reduction of shock and damage and the cost advantages our new packaging involves, we consider that there is a distinct advantage in personnel usage. We no longer have the special problems arising from the use of select labor in close quarters. We no longer have to work out details of using "left-handed" nailers and "right-handed" nailers—with reference to each other.

We do not fabricate any of our own packaging materials, including skids. Since we wish to concentrate on the manufacture of appliances we do not wish to manufacture packaging components in our own plants. Thus, we buy our boxes, interior members, wadding, tape and skids from companies whose business it is to make them—ready for use.



This entire line is new — having been engineered especially for the operational use of Hotpoint's new corrugated package for laundry appliances. This line receives appliances from the elevator (lower right) and after packaging them, delivers into the warehouse area. In the area shown on this drawing, manual techniques and new machinery combine — to complete each package.

Packaging Institute publishes new glossary

No price can measure the usefulness of the second edition of "Glossary of Packaging Terms" recently published by Packaging Institute. Its content goes far beyond the scope of a mere industrial or technical dictionary and is virtually a course of packaging education.

For example, its definition of "vacuum packaging" occupies almost a full page, and outlines the basic concepts, materials used, and standards of acceptability of vacuum packages. Another representative definition, that of "wet mil" (referring to the number of mils of adhesive or coating thickness in the wet state as applied to a surface), uses a formula and calculated illustration. This explains how the wet mil is generally derived by dividing the volume of adhesive applied by the area covered.

Details About Dimensions

A valuable feature of the book, representing its use of new material is an appendix discussing container dimensions. It tells how to determine dimensions of paper, pouch-style and textile bags, squeeze bottles, wooden barrels, corrugated and solid fibre boxes, wirebound boxes and crates, nailed wooden boxes, metal cans, folding cartons, fibre drums, metal pails and drums, glass containers, paper shipping sacks, liquid tight paper containers and collapsible metal tubes.

Indicative of the comprehensiveness of the treatment is the discussion of dimensions of metal cans. It explains the conventionalized method of using three-digit numbers to express dimensions (such as 303 x 406 meaning 3-3/16 x 4-6/16 inches) and tells how to state dimensions of oval, obround or obrotund cans—and how to interpret these dimensions. Also, there is in this appendix an unusually complete discussion of problems and factors involved in determining dimensions of various types of bags.

A glance at another representative definition emphasizes the function and utility of the book. "Ocean cube" appears as "cube (ocean shipping)" —illustrating the alphabetical arrangement of all definitions. Also, this definition is almost half a page long and reveals not only the details of ocean cube dimensions but also explains the "rounding-off" of them.

Much Explanatory Data

Obviously some definitions are extremely short, but where length is indicated, the material is there. For example, the definition of "blushing" not only tells what it is, but when it occurs and how it may be avoided—such as by means of a retarder or by dehumidification of the ambient air which contributes to its occurrence in the first instance.

This 323-page book (bound with hard covers) contains 296 pages of definitions ranging from "A-end" through "yield value" and has two appendices (one on container dimensions and the other on weights and measures) and a list of PI test procedures. Some 44 industry associations, corporations and governmental agencies contributed information of specific value to those spearheading the Glossary project for PI.

Those wishing copies of this landmark book may purchase them at $6.75 a copy (with special rates for quantity orders) from:

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Earliest Packaging of legume inoculators involved first the bottles, second the can—at right. Bottle closures used plaster of paris and a toothpick stuck through a cork—to get the right breathing properties. Can closure proved too tight—upon being opened the can contents blew up. Gas developed within the container because the product could not breathe.

These inoculators are developed as liquid cultures, as seen at top. Prior to packaging they meet their carrier, a ground peat humus. Thus, the product going into the package looks like the inoculator seen here, and has a moisture content of 35 to 38 per cent when inoculator and carrier combine.

Packaging a living organism

By Dr. A. A. Hendrickson
Chief Bacteriologist, Farm Laboratory Division
The Albert Dickinson Company, Chicago

Dr. Adolph A. Hendrickson has been associated with the Dickinson organization since 1933. He is a graduate of the University of Wisconsin with a Ph. D. in agricultural bacteriology. He was a research fellow of the Wisconsin Research Fund and of the Ohio State Experimental Station. Dr. Hendrickson belongs to five scientific societies and groups.

So that farmers receive our legume inoculators in the same condition as we ship them, we have had to solve several packaging problems. These products are living organisms and while packaged must (1) be protected against loss of their moisture content and (2) must be able to breathe. Although it has taken the experience of years to evolve the package we are now using, we have profited from the experience of others: Some of the packaging technology which others have used to keep moisture *out of* their packages has helped us keep our moisture *in*.

WHAT WE PACKAGE. We develop our legume inoculators as a liquid culture. In order to ship these to dealers (who in turn supply them to farmers for mixing with farm seeds at time of planting) we use a ground peat humus as a carrier. By the time this humus has been ground to a 200 mesh or better and dried (and has a moisture content of nine to eleven per cent) it is ready to receive the liquid bacteria culture.

Present package is this fibre can with seamed metal ends, with the body stock lined with aluminum foil. Body stock itself is duplex kraft—with asphalt. Big problem was getting foil of just the correct pinholing—to permit breathing and still protect product moisture. This foil is 0.00035 in. thick.

Both rigid and flexible packages serve as containers of various Dickinson legume inoculators. Packages do not indicate weight or volume because inoculators sell on the basis of how much seed the materials will inoculate. Pouch material is a lamination of aluminum foil and paper.

Here is a review of years of experimentation in getting just the right package for a living thing. Among the interesting lessons learned from the author's developmental work is the fact that aluminum foil pinholing (in just the right amount) can be a positive advantage in providing correct breathing properties and moisture retention.

When we add this to the humus we have a product whose total moisture content is approximately 35 to 38 per cent.

RANGE OF SAFETY. We have found that the critical point of our moisture content is 20 per cent. Thus we have in effect 15 to 18 per cent as a safety factor. Although we package our inoculator so that it keeps most of its moisture, we have to allow for adverse storage conditions at points of use. Even with the best of storage (a cool, dry place) a packaged inoculator loses three per cent moisture in six months.

Finding Right Package

Our cumulative packaging experience over the years is a case history of package development. We started with a bottle and a tailor-made way of getting the right closure. That was when we produced and shipped a liquid or an agar base culture. Now, using humus as a carrier, our basic package is a fibre can with seamed metal ends—with an aluminum foil lining. This package gives us our two necessary properties: Retention of product moisture and provision for product breathing. Our foil has the correct amount of pinholing to permit the requisite breathing.

PACKAGING PROPERTIES. Using as a guide the established aluminum foil specifications as to gauge and pinholing, we started experimenting and ran enough performance tests to ascertain the correct foil, which is 0.00035 inches thick, as well as other packaging properties. Addition of a paper backing gave a total thickness of 0.025 inches. We gave our performance requirements to our supplier, W. C. Ritchie and Company, and let its technicians come up with the right combination.

CLOSE TOLERANCES. We found there was little room for choice in getting the most suitable thickness of foil. With too thin a material, we found too much pinholing, hence loss of moisture from our inoculators. With too thick a foil, breathing was retarded and gas accumulated

within a package. It took experimentation to get the most suitable can body stock—which is duplex kraft—with asphalt between the plies. Further, it took a lot of testing to get the right glue to hold the foil to the fibre can so that the foil would not become separated and thus lose moisture.

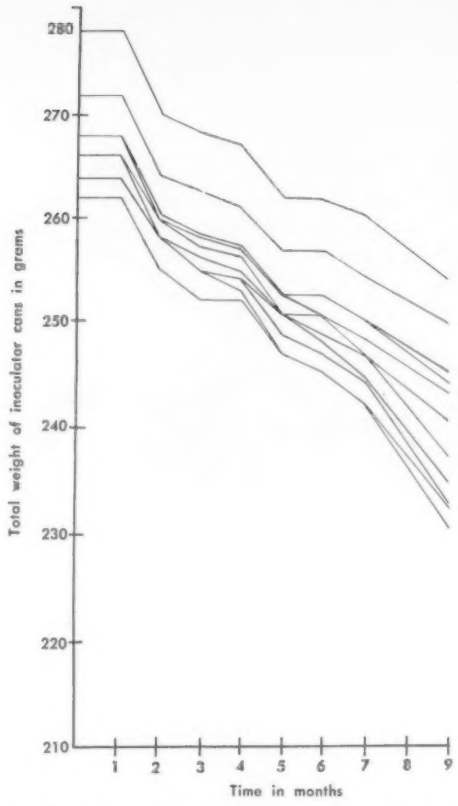
Product Properties Govern

An important lesson we learned was the effect of product properties on our packaging and the importance of (1) knowing these properties and (2) establishing performance requirements to get the most suitable packaging. This involved experimentation with our inoculations as well as their packages. For example, we found many disadvantages in furnishing our culture as a liquid or on a solid agar base—so we came to find another carrier for it.

MOISTURE RATES VARY. After trying a variety of materials such as clays, wood flour, ground limestone, sand and charcoal—among others, we came to pick ground humus as being most desirable. Besides being a natural home for bacteria it presented good absorptive properties without caking and its comparatively lighter weight reduced our shipping costs. After selecting it we came to experiment with varying moisture rates—all of which affected our package development work. After trying various percentages from 15 upward (bacteria survive better above 20 per cent) we settled on a 35 to 38 per cent moisture content as being about what we wanted.

PACKAGING EVOLUTION. Some of our experiences may guide others in what not to do! For example, when we first tried our moist (35 per cent) humus in a plain fibre can, the moisture went through the can body like a blotter. We tried a metal can with a single friction plug top but found these jarred loose with rough handling in transit. Next, we went to a triple friction tight plug. But this was too tight.

CAN'T BE TOO TIGHT. What happened was that gas built up within the container. While not enough to blow off a top, as soon as a consumer started to open a container, both closure and contents blew up in his face. This gas developed because the product could not breathe through the container. In our search for a container with a body that would allow breathing we came to our present foil-lined can.



Effect of aluminum foil on the loss of moisture over a period of nine months.

Current Package Usage

Because inoculator quantities sell on the basis of how much seed they treat, we grade our packages in terms of seed content to inoculate, rather than a basis of specific fill by weight or volume. We have six can sizes, representing various seed quantities, kinds of seeds and planting practices. We calculate these both in bushels and in pounds. In addition to these cans we also have a flexible package—a pouch holding enough inoculation for eight pounds of seed, for example.

DETAILS OF POUCH. We use a lamination of aluminum foil and paper, which Continental Can's Shellmar-Betner Division worked out for us—to meet our performance requirements. This is a heat-sealed package. We tried various combinations of plastic films and paper prior to reaching our present package. Even though this lamination has only foil and paper it is sufficient because of the small amount of inoculation contained, as compared to the contents of a can.

TESTING GOES ON. An important feature of our packaging program is that we are continuously testing both product and package. We keep tests of moisture loss and use the dilution method to check bacterial numbers. We make growth comparisons in the green house for quality control. With all of this experience behind us it is almost humorous to look back at our earliest efforts to establish package protection—when we used plaster of paris and a toothpick stuck through a cork as a bottle closure, to get just the right breathing properties.

News of packaging personnel

GILBERT A. PITMAN has joined the staff of the packaging research and development laboratory of Western Waxed Paper Division, Crown Zellerbach Corporation, San Leandro, California. Mr. Pitman was previously executive officer and secretary, Western Fresh Fruit & Vegetable Container Institute.

New president of Carr-Lowrey Glass Company, Baltimore, is JOHN H. FUNKEY. He succeeds the late GEORGE F. LANG. Mr. Funkey is also new president of Swindell Brothers, Inc., Baltimore. He was formerly a vice president of Carr-Lowrey.

C. R. HILGENBERG, Carr-Lowrey vice president and secretary, is also now treasurer of the company. J. J. JEFFRIES, vice president and secretary of Swindell Brothers, is now assistant treasurer of this firm, and W. J. BURT, assistant secretary of Carr-Lowrey, is now also assistant treasurer.

CYRUS L. FULTON, vice president and director of Anchor Hocking Glass Corporation, is now a director of Carr-Lowrey and Swindell Brothers. Carr-Lowrey is a subsidiary of Anchor Hocking and Swindell Brothers is a subsidiary of Carr-Lowrey.

Stone Container Corporation, Chicago, has named W. C. LASSMAN assistant sales manager and JOHN HOVEZAK sales promotion manager of W. C. Ritchie and Company, Chicago, a Stone subsidiary. Mr. Lassman was previously sales service manager and Mr. Hovezak was formerly with American Can Company and Cleveland Container Company.

New board chairman of Standard Packaging Corporation, New York, is R. CARL CHANDLER. Prior to joining Standard Packaging he was vice president of Union Bag and Paper Company.

American Can Company announces the appointment of C. F. LAUSTEN as general manager of its equipment division, and of R. B. THOMPSON as general manager of its general manufacturing department. Mr. Lausten was previously general manager of the general manufacturing department and Mr. Thompson, assistant general manager. C. F. HEIBERGER succeeds Mr. Thompson as assistant general manager and C. E. MARTIN succeeds Mr. Heiberger as assistant manager of manufacture in Canco's central division.

NORMAN BARKER JR. is now assistant credit manager of Canco's central division, in Chicago. Mr. Barker was previously assistant cashier, Harris Trust and Savings Bank, Chicago.

American Bag & Paper Sales Corporation, Philadelphia, has named HAROLD P. WILLIAMS as sales representative covering New Jersey, Pennsylvania and Ohio. Mr. Williams was previously associated with Continental Can Company's Shellmar-Betner Division. He will operate out of Philadelphia in his new capacity.

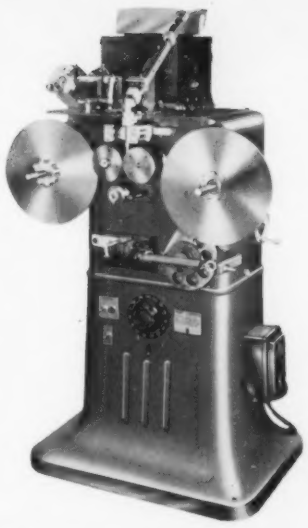
The Dow Chemical Company has appointed OLIVER J. BEUTEL manager of distribution and traffic, a new position, with company-wide responsibilities. Previously, Mr. Beutel was traffic manager of Dow's Texas division, at Freeport. In his new position, he headquarters at Midland, Michigan.

New secretary of St. Regis Paper Company is HOMER CRAWFORD. He succeeds WILLARD J. DIXON, who continues as vice president and director of the company. Mr. Crawford was previously a member of LaBoeuf, Lamb and Leiby, New York law firm serving St. Regis.

JUDSON BEMIS is now executive vice president of Bemis Bro. Bag Company, St. Louis. He was previously vice president and director of central operations. T. H. ASHTON, formerly manager of the Omaha plant and sales division, succeeds Mr. Bemis as director of central operations. C. W. AKIN, formerly assistant director of sales, is now manager at Omaha.

Bemis has named R. M. HERSEY sales director for national accounts,

(Continued on Page 31)



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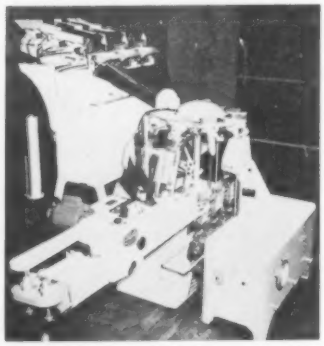
Bag Packaging System

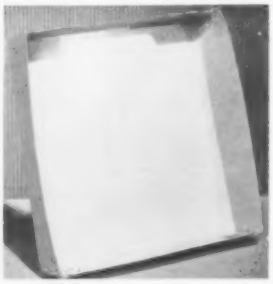
Wright Machinery Co. announces its latest equipment—a three-unit system of packaging free flowing products in



cellophane, glassine, wax or foil bags. These units are (1) a weigher, with three weighing heads; (2) a bag applicator that automatically feeds preformed bags to filling spouts, and (3) a bag transfer unit, which snaps bag tops and delivers filled bags for heat sealing. All three units are integrated. Circle No. 1.

Polyethylene Coated Board

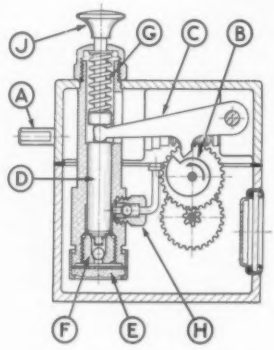
Robert Gair Co., Inc. announces a new white polyethylene coated board — with a coating that utilizes Bakelite



polyethylene impregnated with particles of titanium and extruded on paperboard. It has a glossy white surface in addition to being grease- and moisture-resistant, according to Gair, who reports its use in the bottom section of a two-piece Kliklok carton. Circle No. 2.

Wrapping Machine Lubrication

Bijur Lubricating Corp. now has an automatic, centralized lubrication system for equipment such as Globe bacon



Letters denote "lube" points

wrapping machines, on which the new lubricating units are installed. This equipment provides automatic lubrication of 46 key bearing parts formerly lubricated by hand. A pump and reservoir, a distribution system and a metering device are the key parts of the equipment. Circle No. 3.

Can With "Spun-On" Ears

American Can Co. now has a gallon paint can with "spun-on" ears, thus eliminating the soldering operation. There are three steps to the ear-spinning operation: (1) Punching of two round recesses in body blank; (2) placing of ears in recesses, and (3) spinning operation to crimp ear from other side of blank. Circle No. 4.

Protective Lining Material

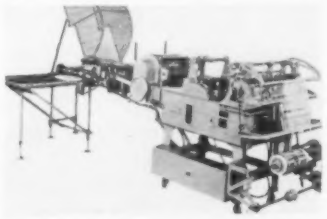
Cook Paint & Varnish Co. now produces protective steel shipping container linings, under license of Synthetasine Protective Coatings, Inc., owned by Steel Shipping Container Institute. This new plastic lining is a result of research conducted by Battelle Memorial Institute, under sponsorship of the steel shipping container industry. Circle No. 5.

Cellophane Bag Machine

Frank Hamacheck Machine Co. says that its new "Ideal" cellophane bag machine runs at speeds from 6,000 to 18,000 an hour depending on bag size, which ranges from 1½" by 3" to 10½" by 33". It reports the machine registers printed film without electric eye and permits increasing or decreasing pressure (on center seams) without stopping machine. Circle No. 6.

Polyethylene Bag Machine

Simplex Packaging Machinery, Inc. reports improvements on its Model 4-7 bag making machine to increase high



quality production and reduce waste. One operator on two such machines can produce 50,000 bags per shift, according to Simplex. Circle No. 7.

Polyethylene Slip Agent

H & H Products announces a new attachment for bag machines, to spray a powder onto polyethylene film, thus giving slip and avoiding any sticking.

1. Beneath each item of literature offered, machine or product announced, and beneath each advertisement, is a code number. As you select those on which you want more information *note* this number.
2. *Circle* corresponding number on post card.
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February, 1956

(This card void after March 31, 1956)

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MACHINES AND PRODUCTS

1	2	3	4	5
6	7	8	9	10
11	12	13		

INDUSTRY LITERATURE

101	102	103	104	105	106	107	108	109	110	111
112	113	114	115	116	117	118	119	120	121	122
123	124	125	126	127	128	129	130	131	132	133
134	135	136	137	138	139	140	141	142	143	144
145	146	147								

ADVERTISED PRODUCTS AND SERVICES:

201	202	203	204	205	206	207	208	209	210	211	212	213	214	215

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City _____ Zone ____ State _____

MACHINES AND PRODUCTS

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INDUSTRY LITERATURE

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134	135	136	137	138	139	140	141	142	143	144
145	146	147								

ADVERTISED PRODUCTS AND SERVICES:

201	202	203	204	205	206	207	208	209	210	211	212	213	214	215

Use this space to ask _____

for tear sheets or other _____

information wanted. _____

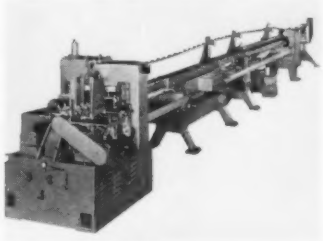
Reports point out the unit requires from two to twelve pounds of air for its operation. Circle No. 8

Electronic Scales

Toledo Scale Co. announces a new digital-scanning electronic unit that transmits weights to user's remotely located data handling devices. Uses include totaling items passing over a roller conveyor, recording batch ingredients, remote supervisory weight checking. Unit can be applied to current types of Toledo Industrial Dial Scales. Circle No. 9.

Can Bodymaker

E. W. Bliss Co. reports a new automatic sanitary can bodymaker, designated as #403. This machine is com-



pact and easily adjustable. It is equipped with automatic controls, limit switches, and control panel. It produces 400 to 450 cans per minute, ranging from 2⅜" to 5⅛" high and from 2-1/16" to 4¼" diameter. Circle No. 10.

Auger Filling Machine

Stokes & Smith Co. reports its Model EG Universal Auger Filler features 40 per cent fewer working parts than pre-

vious models. It is designed for volumetric filling, pressure packaging, gross weighing or combination auger-vacuum. Capacity is from ⅛ oz. to 5 lbs. in rigid or flexible packages. Circle No. 11.

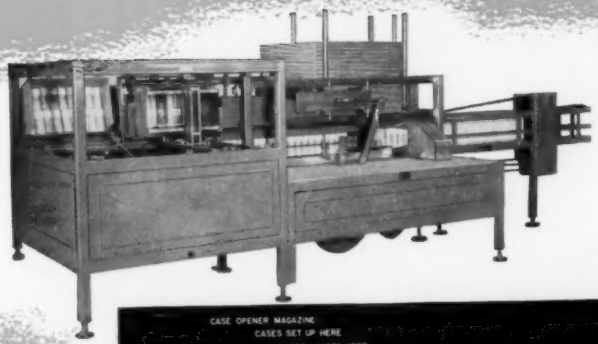
(Continued on Page 34)

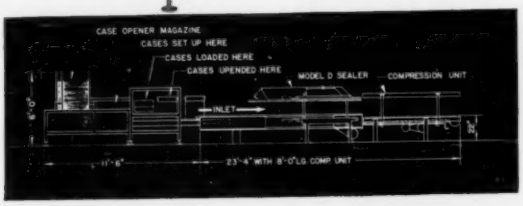
Packomatic

AUTOMATIC CASE OPENER AND LOADER

Custom Engineered

TO CUSTOMER'S REQUIREMENTS





Ask for folder 600-54A

TWENTY OR MORE CASES PER MINUTE ON THIS CUSTOM ENGINEERED MACHINE. Depending upon the size of the unit to be loaded, proportion, and packing arrangement of the case, speeds of 20 per minute are possible. Available as a single tier end-opening case loader for low speeds, and with horizontal grouping mechanism for higher speeds on the same type of case.

Multiple tier loading as depicted is used to pack such items as breakfast cereals, petroleum products, synthetic detergents, waxes, and so forth.

Packomatic PACKAGING MACHINERY

J. L. FERGUSON COMPANY
JOLIET, ILLINOIS

New York Chicago Cleveland Boston Baltimore Portland Denver
Los Angeles San Francisco Seattle New Orleans Tampa

Dream Packages

Start with

Someone Who is Wide Awake

Behind the package that refuses to be ignored—the one that attracts the shopper's hand like a magnet, is an individual or a team alert to new ideas, new opportunities.

The foundation for dozens of tomorrow's prize winning food containers is in the making at the new Crossett bleached board mill. On a huge new cylinder machine, soft and hard wood pulps are rigidly controlled to produce a board that will do the job you want done.

Want it tough—want it white—want it smooth—want it to multicolor print like a page in Fortune? You call the play—we'll find the way. That's the beauty of our highly flexible production equipment. We can make it sit up and do tricks.

May we talk with you about the many additional advantages of assuring yourself a consistent supply of board to your specifications from this independent mill?

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R. J. Lantry, J. T. Allen
1816 First National Bank Bldg.

Unsolved folding carton problems

(Continued from Page 10)

from one supplier, but controlled from delivery to delivery from different suppliers.

Here again, we have the machine operators' request for uniformity within the folding carton producing industry.

Packing And Storage

The packing and storage of unfilled cartons is not a packaging machine operation. However, it does have a direct bearing on that operation.

A flat carton, ready to be fed into the packaging machine, may vary from one to three times the thickness of the stock. We then put hundreds of these flat cartons into a shipping case. The shipping case may be packed tight to help it support the load on top of it, or it may be packed loose to preserve the pre-break of the score lines in the cartons.

FATE OF CASES. And then our trouble begins. We toss the shipping case around, drop it, palletize it, brick pile it, stack it to the visible height of the storage space, open some cases for inspection of cartons, ram trucks into the stacks, freeze them in winter, bake them in summer, dry the cartons at low relative humidity, and soak the cartons at high relative humidity.

The corrugated cases do not support the load placed on them. It is the flat cartons in the shipping case that do the supporting. The result: Warped, bent or damaged cartons. And these are the cartons the machine operators get to feed into those packaging machines.

Approach To Solutions

How can we lick this problem? One manufacturer using several hundred millions of glued end cartons annually does not have the answer. Neither do his carton manufacturers.

Possibly, a partial answer might be this:

1. Buy the cartons in the flat and have them packed on skids for delivery to the user.
2. Store the skids of flat cartons until required for production.
3. The user would fold and glue the side seam as required for production.

THIS PLAN MAY SPREAD. Some users of folding cartons are now using this system, and like it. Possibly, this system will enjoy extended use as more and more manufacturers realize what is happening to their folding cartons under storage conditions, and the effect of using damaged cartons on their packaging lines.

Every producer and user of folding cartons has problems. Some of these problems stem from practices within the folding carton producing industry. Others are of our own making. The solving of these problems, if they are to be solved, is a cooperative adventure. No one segment can do it without the help of the others.

More news of packaging personnel

(Continued from Page 27)

a new position. He was previously manager of the Minneapolis general sales division. J. H. EASTMAN succeeds Mr. Hersey in the latter capacity and M. F. P. DALLISON is now special account representative at Minneapolis. Both Mr. Eastman and Mr. Dallison were previously in sales work for Bemis at Minneapolis.

STEWART ECKERS is now manager of Bemis' Baltimore sales office, supervising Bemis sales in the upper Chesapeake Bay area.

The Pfaudler Company, Rochester, announces that RANLET MINER is now chairman of the board and DONALD A. GAUDION is now executive vice president. Previously vice chairman of the board, Mr. Miner succeeds his late father, EDWARD G. MINER, as board chairman. Mr. Gaudion was previously vice president and assistant to the president.

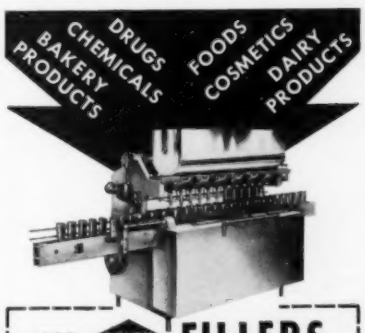
Arthur Colton Company has appointed ERWIN V. KISTNER sales engineer, operating from the company's New York office, handling machinery sales in Southern New Jersey, Eastern Maryland, Delaware, Eastern Pennsylvania and Washington, D. C. Mr. Kistner was previously a sales engineer for Lowe Engineering Company.

EUGENE L. MARTINEZ has been named manager of The Dow Chemical Company's new sales office in Buffalo. He was previously a general chemicals salesman in Dow's New York office. Chemicals salesmen in the new Buffalo office include SEWARD H. MOTT JR. and GERALD L. MITCHELL. Plastics salesmen assigned there include Ross D. VISGER, plastics supervisor, ROBERT F. BUNKER, ROBERT S. CREW and DONALD W. RUOFF.

New labor relations director of Glass Container Manufacturers Institute is A. J. MARTIN. He was previously labor relations director of Owens-Illinois Glass Company. He succeeds the late RALPH A. LIND. In addition to serving GCMI, Mr. Martin will also be labor relations director of the National Association of Manufacturers of Pressed and Blown Glassware.

W. M. LARSEN is to be manager of the newly-established Akron district office of Phillips Chemical Company's plastics sales division. He was previously marketing assistant in the Phillips Petroleum Company sales department.

(Continued on Page 35)



USE GEYER FILLERS
TO FILL YOUR PRODUCTS
and benefit 4 ways!

Geyer filling machines are your best buy because:

1. one machine handles a variety of sizes and types of containers
2. many semi-liquid and semi-solid products can be handled on the same machine — jellies, jams, preserves, mayonnaise, peanut butter, pastes, etc.
3. they change over easily, quickly to different size and type containers
4. they fill from 20 to 300 containers per minute

Write, wire or call for additional details and let us bid on your job.

THE FILLER MACHINE CO., INC.
the original builder of Philadelphia piston fillers
12 Penn Ave., Rockledge, Phila. 11, Pa. Pilgrim 5-0170

Industry literature available free

1. Beneath each announcement is a code number. As you select items on which you want more information, *note* this number.
2. Now, *circle* the corresponding numbers on the postcard.
3. Next, *fill in* your name and address.
4. Then, *mail* the card — we pay the postage.

Vacuum Forming Machine

Formvac Corp. booklet describes automatic vacuum forming machine that can be adjusted to handle rigid and semi-rigid thermoplastic sheets. Circle No. 101.

Jar And Bottle Labelers

Pneumatic Scale Corp. Bulletin 129 provides photos, drawings and specifications for two models of machines that apply body labels to round bottles and jars up to 300 per minute. Circle No. 102.

Heat Sealers

Wrap-Ade Machine Co. offers bulletin and price list for three models of jaw-type heat sealing crimpers and their special attachments. Circle No. 103.

Counter And Filler

Brown Bag Filling Machine Co. has leaflet describing semi-automatic machine that counts and fills small products such as screws, nuts, etc. in rigid or flexible packages up to 35 per minute. Circle No. 104.

Capping Machines

Resina Automatic Machinery Co. folder illustrates ten different machines for jar and bottle capping and can sealing. Specifications and capacities are included. Circle No. 105.

Liquid Fillers

MRM Company, Inc. eight-page catalog illustrates its line of liquid fillers with specifications. Models include gravity, vacuum, volumetric, automatic and semi-automatic units. Circle No. 106.

Bag Sealer And Labeler

Amsco Packaging Machinery, Inc. specification sheet describes automatic jaw-type bag sealer with vacuum labeler. Detailed photo is captioned to identify each vital part of unit. Circle No. 107.

Filling Machines

Stuyvesant Engineering Co. describes line of fillers for dry, semi-dry free or slow flowing products in brochure. List of present users is included. Circle No. 108.

Wire Stitching

Acme Steel Co. shows line of wire stitchers and wire with complete specifications for each type in Catalog AD-131. Circle No. 109.

Winders

Hobbs Mfg. Co. brochure illustrates with specifications and layout diagrams its line of winders for paper and plastic films. Check list for individual needs is included. Circle No. 110.

Automatic Packaging Machines

F. B. Redington Co. 32-page catalog completely describes this company's line of cartoning, wrapping and special machines for packaging a wide variety of products. Circle No. 111.

Carton Forming And Closing

Peters Machinery Co. offers an illustrated brochure that gives specifications and floor plans for this company's carton forming and lining, and folding and closing machines. Speeds range from 30 to 120 cartons per minute. Circle No. 112.

Wrappers

The Globe Company has a brochure providing specifications and illustrated descriptions of its machines. Units are automatic and adjustable for underfolding or overwrapping using heat sealing wrapping materials. Circle No. 113.

Pouch And Bag Maker

Conapac Corp. describes a pouch attachment for its Model C cellophane bag machine in current bulletin. Unit permits fabrication of conventional bags or three sides seal pouches 1½" to 9½" wide by 3" to 17" long. Circle No. 114.

Prepackaging Closures

A. Kimball Company folder lists line of colored bands called Ti-Paks. Used for bunching vegetables and as bag closures, they are ¼" or ½" wide. Circle No. 115.

Vinyl Film

The Goodyear Tire & Rubber Co. leaflet lists physical properties of Vita-film, with sizes available. Material has many uses for wrapping non-food products. Circle No. 116.

Packaging Resins, Plastics

Bakelite Co. has published a 1956 "Guide to Improved Packaging" that illustrates applications for vinyl and polyethylene film, polyethylene based coatings, phenolic and polyethylene plastics, and rigid vinyl. Circle No. 117.

Military Packaging

Kimberly-Clark Corp. lists applications of its cushioning materials covering federal specifications, cushioning, liquid and shock absorption, surface protection and blocking packs in 10-page booklet. Circle No. 118.

Adhesives

H. B. Fuller Co. catalog lists 17 kinds of adhesives for bottle labeling, carry-home cartons, fibre case making, case sealing and tax stamp pasting. Suggested use with particular machines is included. Circle No. 119.

Rigid Plastic Boxes

Bradley Industries pictures 140 styles of plain and fancy polystyrene stock boxes in its 20-page catalog. Price list is included. Circle No. 120.

Plastic Film

The Visking Corp. offers a 20-page technical data booklet that lists the characteristics and properties of Visqueen film. It explains the physical and chemical structure of polyethylene and provides a bibliography. Circle No. 121.

Rigid Acetate

Monsanto Chemical Co. has a sample swatch of its transparent rigid acetate in five gauges from .005" to .020". It can be printed, embossed, stapled or cemented. Circle No. 122.

Transparent Sheeting

Eastman Kodak Co. lists properties of five grades of its cellulose ester sheet. Bulletin provides shrinkage and heat softening temperature charts and itemizes weights, areas and gauges available. Circle No. 123.

Rust Prevention

Angier Corp. offers a 12-page booklet outlining company's vapor inhibitor papers. It tells what they are, how they work, their uses and limitations and methods of employing them. Circle No. 124.

New Aerosol Spray

Du Pont "Kinetic" Chemicals Div. Technical Memorandum KTM-20 describes new formulation offered to aerosol industry. It prevents silver from tarnishing yet can be washed off with soap and water. Circle No. 125.

Polyethylene Bottles

Royal Mfg. Co. Inc. pamphlet lists line of stock polyethylene bottles and fitments with capacities and sizes. Styles include Boston, modified Boston and cylinder rounds, flat and modern ovals, oblongs and tapered rounds. Circle No. 126.

Unit Packaging Service

Unette Corp. offers comprehensive bulletin on its new unit packaging service for close tolerance filling of creams and liquids in small plastic tubes. Suitable for foods, drugs, cosmetics, chemicals, paints, etc. Circle No. 127.

Glass Containers

J. Rabinowitz & Sons, Inc., a distributor of glass bottles, jars and metal closures for the food, drug, chemical, and cosmetic fields, has a catalog available. Circle No. 128.

Vacuum Forming Unit

Vacuum Forming Corp. has an illustrated folder reviewing its new Model 88-M and Model 88-FM forming press that provides two-way vacuum and drape forming—with male and female molds. Circle No. 129.

Film About Taping

Minnesota Mining and Manufacturing Co. announces national availability of a new 25-minute sound film, "Tape It Easy." This is a 16-mm. color film showing manual, semi-automatic and automatic taping machines in action, emphasizing tape automation. Circle No. 130.

Rotary Piston Filler

The Pfaudler Co. has a bulletin (911 Supplement) on its 35-station piston filler, noted for its high speed of operation. This bulletin includes both photos and drawings of filler details and functioning, and reviews important features. Circle No. 131.

Fibre Cans

R. C. Can Co. announces a new two-color catalog of its fibre cans of different kinds and sizes. This catalog also contains information on construction, materials, shapes, closures, and reviews specialty items and their applications—including "easy-open" packages. Circle No. 132.

Cellulose Banding Machine

Economic Machinery Co. announces its Bulletin BA-168 which describes its cellulose banding machinery. This bulletin not only sets forth pertinent features of this automatic equipment but has sets of drawings illustrating process cycles for plain and printed bands. Circle No. 133.

Wrapping Machinery

Miller Wrapping & Sealing Machine Co. Model MPS unit wraps boxes, trays, etc., sealing with heat or glue, up to 21 packages per minute. Powered from wall outlet, it is mounted on casters. Folder gives specifications. Circle No. 134.

Case Opening, Loading, Sealing

J. L. Ferguson Co. booklet diagrams and illustrates several models of this company's case openers, loaders and sealers. Circle No. 135.

(Continued on next page)

ABSOLUTELY ACCURATE 2 VALVE FILLER

Elgin EARNS ITS WAY

"TWIN"

The Perfect Filler for Glass, Plastic and Tin containers. Accurate Ingredient Fill for Aerosol Packing

The Elgin "Twin" is a rapid, faultless producer. This Filler features a unique method for controlling the piston stroke, resulting in two speeds: high-speed on cylinder filling, low-speed on container filling. Easily adapted to a broad range of products and container sizes, the Elgin "Twin" insures an accuracy of fill you can rely on for either liquid or viscous products. Easily cleaned —ideal for light or heavy packs and ideal for aerosol packing—the Elgin "Twin" earns its way in labor and product savings!

PACKAGING MACHINERY MANUFACTURERS INSTITUTE PMMI MEMBER

Write for complete literature Address Dept. E62

ELGIN MANUFACTURING COMPANY

200 Brook Street • Elgin, Illinois

Showing a hosiery manufacturer how he could mark his boxes with variable detail in half the time required by hand stamping —and get far better imprint quality besides—typifies the way the Markem Method works. Markem studies the needs — recommends the right machine, type and ink for the job, follows up with installation, operator instruction, maintenance and supply. In marking textiles, tools and hardware; shoes and leather products; plastics and pharmaceuticals; electrical components and clothing—the Markem Method results in better marking. Find out how it can benefit you, by writing Markem Machine Co., Keene 36, New Hampshire.

MARKEM ...TO MAKE YOUR MARK

Collectors And Packers

Standard-Knapp Div. of Emhart Mfg. Co. offers its latest bulletin on collectors and packers that pack cases with cartons, bags, or cans. Circle No. 136.

Rotary Vacuum Filler

U. S. Bottlers Machinery Co. has a 16-page catalog of its six basic models, with 14 adaptations for handling liquids and semi-liquids. This catalog gives photos drawings and specifications. Circle No. 137.

Fillers And Cappers

Elgin Mfg. Co. describes twelve kinds of fillers and cappers for foods, paints, cosmetics, and oils in an illustrated folder. Circle No. 138.

Automatic Packer

U. S. Automatic Box Machinery Co. has a folder which reports speeds up to 160 per minute on most powders or granules with round, square or irregular containers. This folder gives details for Model JN packer, filler, packer-weigher. Circle No. 139.

Carton Prefolding

The International Paper Box Machine Co. outlines the importance of prefolded cartons in a high speed packaging line, in its 64-page catalog, illustrated with diagrams and pictures. Circle No. 140.

Filling Machinery

G. Diehl Mateer Co. discusses its filler that handles liquids, powders or pastes up to 240 per minute with 99.7 per cent mechanical accuracy reported. Brochure gives details. Circle No. 141.

Marking Equipment

Industrial Marking Equipment Co. has a catalog showing its line of conveyor line markers, multi-wall bag, case and pail printers. Illustrated, with prices for units shown. Circle No. 142.

Wrapping And Packaging

Battle Creek Packaging Machines, Inc. gives specifications and pictures of 25 models of machines used for over-wrapping, carton filling, lining and sealing, in a 16-page catalog. Circle No. 143.

Paper, Textile, Plastic Bags

Bemis Bro. Bag Co. reviews its various kinds of paper, textile and plastic bags, discussing this line in pocket size reference booklet. Circle No. 144.

Moistureless Adhesive

Kleen-Stik Products, Inc. offers a file folder of sample tags and labels demonstrating features of its pressure sensitive adhesive. Circle No. 145.

Polyethylene Sheet

The Plastics Div. of Celanese Corp. offers polyethylene in gauges from .015" to .090", in its Product Bulletin NP-13, listing properties, characteristics, and uses. Circle No. 146.

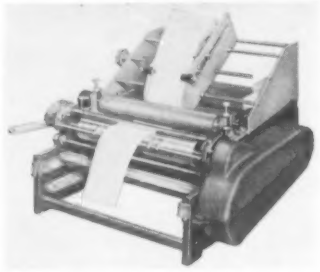
Collapsible Tubes

A. H. Wirz, Inc. offers a booklet detailing its line of tubes, applicators and closures, including a capacity chart, size and tolerance chart and a standard tube nomenclature. Circle No. 147.

More announcements of machinery, products

Fast Coating Machine

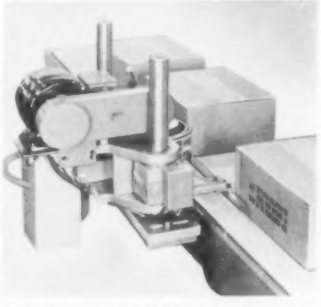
Potdevin Machine Co. announces a new, versatile coating machine; Model 2R. Using any coating material it coats



from a 1" strip to overall. A regulator controls thickness desired. Machine is adjustable for various label sizes and is available in 6, 9 and 12 inch widths. Circle No. 12.

Case Imprinting Unit

Adolph Gottscho, Inc. has a new motor-driven, flexographic case imprinting unit that attaches to a conveyor line.



Called the "750 Rolaprinter" this equipment has two special features: A micro-switch activated electro-mechanism and a vertical flexographic printing system, using a variable speed mechanism that synchronizes with surface speed of moving containers. Circle No. 13.

Index of Advertisers

American Viscose Corp. . . . . inside back cover

Crossett Paper Mills 30
For more information circle No. 210 on Reader Service Card

Dobeckmun Co. 5
For more information circle No. 204 on Reader Service Card

Elgin Manufacturing Co. 33
For more informatin circle No. 212 on Reader Service Card

George D. Ellis & Sons Inc. 23
For more information circle No. 207 on Reader Service Card

J. L. Ferguson Co. 29
For more information circle No. 209 on Reader Service Card

The Filler Machine Co., Inc. 31
For more information circle No. 211 on Reader Service Card

The Goodyear Tire & Rubber Co., Inc. 1
For more information circle No. 202 on Reader Service Card

Hinde & Dauch 6
For more information circle No. 205 on Reader Service Card

R. A. Jones & Co., Inc. . . . . outside back cover
For more information circle No. 215 on Reader Service Card

Markem Machine Co. 34
For more information circle No. 213 on Reader Service Card

Riegel Paper Corp. 8
For more information circle No. 206 on Reader Service Card

Scandia Manufacturing Co. . . . . inside front cover
For more information circle No. 201 on Reader Service Card

Stone Container Corp. 3
For more information circle No. 203 on Reader Service Card

U. S. Bottlers Machinery Co. 35
For more information circle No. 214 on Reader Service Card

Wrap-Ade Machine Co., Inc. 27
For more information circle No. 208 on Reader Service Card

More news of packaging personnel

(Continued from Page 31)

LEO F. GIVENS has been elected comptroller of Rheem Manufacturing Company. He succeeds C. B. HUESTIS, who resigned to join another firm. Mr. Givens previously was assistant to the comptroller and was located at Chicago. His new position takes him to Rheem's general office, Richmond, California.

D. FLOYD BURNS is manager of Wright Machinery Company's new Southwestern district sales-service headquarters at New Orleans. With Wright since 1942, Mr. Burns was previously engineer, salesman and special representative of the company.

ROBERT L. MCKAY is now president of Shock and Vibration Research, Inc., Detroit, newly-formed research and engineering organization. Mr. McKay was a civilian scientist of the Army prior to joining his new company.

M. B. BISTLINE is now sales engineer under W. C. DOUCE, district manager of Phillips Chemical's New York plastic sales office. Mr. Bistline was previously a development engineer in Phillips' research and development department.

LOOK TO US FOR EVERY

LIQUID FILLING REQUIREMENT

and profit by more than two generations of liquid filling experience. The U.S. line covers a wide range of liquid filling machines for automatic, semi-automatic and hand-filling operations. With this wide choice of Fillers, you need not compromise your production to fit a machine; instead, basic U.S. machines are custom-engineered to fit your specific production . . . and usually at a saving.

Model B-2 Vacuum Filler

provides efficient continuous production, filling two containers at a time. Handles a wide variety of liquids and semi-liquids. Has automatic product supply; vacuum is adjustable and flow regulated for accurate, clean filling. Fills a wide range of containers up to 4½" dia. round or rectangular. Send for Bulletin B-2.

The U.S. Siphon Filler

is a highly efficient machine. Stainless steel filling tubes and glass lined tank. Handles all types liquids; all containers. Fills without overflow or spillage. Send for Siphon Bulletin.

Model B-49 Straightline Vacuum Filler

for liquids and semi-liquids. Most automatic one-operator multiple filler. Operates with or without discharge conveyor. Filling proceeds automatically while empties are loaded. Easy operating lever activates container feed and discharge; otherwise operation is completely automatic. Adjustable for container sizes from AGST to gallon size finishes. A dependable machine where filling cost is a factor. For full details, send for Bulletin B-49.

U. S. BOTTLERS MACHINERY COMPANY

Specialists in Liquid Filling and Container Cleaning Equipment

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What we think

Every so often we hear of dissatisfaction over purchases of packaging machinery. A user complains that a new machine fails to do its job and has to be rebuilt to meet production requirements. A machinery manufacturer points out that the inability of a customer to define the objectives of a machine prevent its maker from building into it the desired performance.

This suggests a distinct need of better communication and a more complete exchange of information between machinery maker and user. In a nutshell, the problem arises where a user cannot or does not focus the supplier's attention on just what to furnish. Likewise, suppliers sometimes send out representatives incapable of analyzing a user problem.

While we might summarily dispose of such complaints by making a plea for better communications, we must emphasize a more basic aspect of the matter: The fundamental task of reducing a problem to essentials and determining what the job is *before* ordering equipment to do it.

Recently, the engineer in charge of packaging machinery for a confectionery manufacturer told us that far too often members of his organization approach a packaging operation with preconceived ideas about specific equipment.

In contrast to this, he insists on considering first the fundamentals. Before thinking about ordering, or even specifying equipment, sound practice dictates a careful, step-by-step analysis of the job itself. Only upon such a study can one predicate an accurate determination of equipment needs, he asserted.

A parallel problem is the task of coordinating the development of an entire packaging line—where several machinery suppliers are working with the user. In this connection, an engineer responsible for packaging machinery development in a multi-plant food products company told us that close coordination is absolutely necessary :

"Each man on the project should know exactly what the others are doing," he urged, pointing out that not only at the start, but also at all stages thereafter, those working on different aspects of a packaging line should know the problems and progress of the others. Tools of good management, such as reasonable use of memoranda and conferences, and good engineering tools, such as time charts covering the sequences of related machinery operations, will facilitate this coordination.

Careful planning as well as careful coordination of project details will go far to eliminate the rebuilding of a machine by its user. Further, before a user criticizes a machinery maker for supplying a machine requiring rebuilding, he first should recall whether or not he gave the maker adequate information.

Before anyone blames a machinery maker for producing equipment based on inadequate data, we might state that usually the heart of the trouble is that the user is not conscious of any lack of information. Rather, he is unconsciously inarticulate and is not aware of what he *really* wants a given machine to do.

He fails to express his objectives because he has not clearly determined them. A thorough analysis, such as a chronological, sequential examination of a packaging operation, should minimize the hazards of equipment purchases based on fragmentary data.

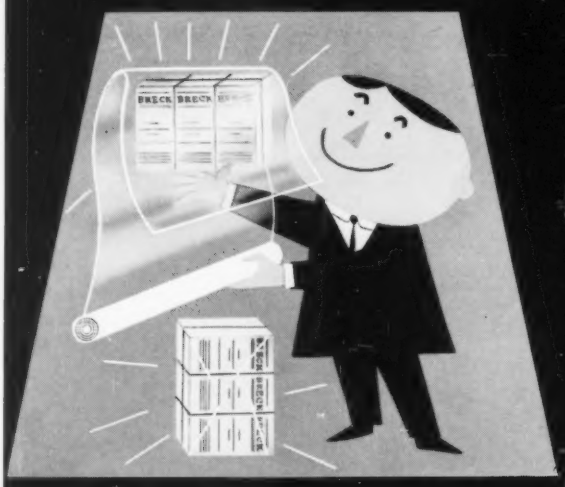
To conclude, we urge attention to three points:

1. Careful analysis of a project or job in terms of fundamentals, in order to define equipment requirements.
2. Complete sharing of all pertinent data with the supplier who is to produce the machine.
3. Better teamwork and more integrated participation of all individuals (users and suppliers alike) working on a common project.

Careful attention to these points does not automatically insure the best possible packaging machinery for a given operation, but there is much to gain and little to lose by following them. Those in doubt might visit companies and engineers who do follow them, to learn first-hand the benefits that accompany (1) systematic analysis, (2) articulate communications, and (3) coordinated teamwork in machine development.

Bruce Holmgren

Editor



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